PERSONAL FINANCE

Mastering Interest Rates

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Topic: Introduction to Interest Rates, Saving vs. Borrowing

Standards:

PPF.7.SI.1: Compare the effects of interest rates as applied to saving and borrowing money
PF.7.SI.4: Analyze the relationship between risk and return

Essential Question: How do interest rates work when I borrow money? How is that different from how interest rates work when I lend money?

Activity: Borrowing vs. Lending

02 DAY

Topic: How Rising or Falling Interest Rates Affect You

Standards:

PF.7.SI.2: Examine how consumers are affected by rising and falling interest rates

Essential Question: Why do interest rates change? What is the relationship between the Federal Reserve and interest rates? How do changing interest rates affect me?

Activities: Changing Interest Rates & How They Affect Us; Graphing Interest Rates

03 DAY

Topic: Simple vs. Compound Interest

Standards:

PF.7.SI.3: Calculate simple and compound interest and explain the difference between the two

Essential Question: What is the difference between simple and compound interest? How long does it take interest to compound?

Activity: Simple Interest vs. Compound Interest

04 DAY

Topic: The Relationship Between Risk & Return

Standards:

PF.7.SI.4: Analyze the relationship between risk and return

Essential Question: What risks do I take as a borrower? What risks do I take as a lender?

Activity: Changes in Interest Rates Over Time

Saving versus Borrowing

We need to understand both sides of how interest works so we can use this concept to our advantage. Sometimes it's easier to understand saving and borrowing with simple examples.

<u>Example 1</u>: Assume you need $2,000 to buy a motorcycle so you can get back and forth to school and work over the next year. Your Uncle Jim agrees to loan you the money at an interest rate of 12%. He also agrees to let you pay the interest each month over the next 12 months and then repay the $2,000 loan at the end of that year. Uncle Jim knows that your grandma told you she would give you $2,000 when you graduate, so he knows you will have the money to repay the principal. How much interest will you pay your Uncle Jim?

To answer this question, we need to know a couple of things about interest rates. First, we need to know that interest rates are usually expressed as an annual percentage rate, or APR. The agreement you made with your uncle was to pay 12% annually. Since you will be paying monthly, you will need to figure out how much interest accrues on the $2,000 each month.

Interest Uncle Jim will earn:
1% per month (12% / 12 months = 1% per month)

Interest accrued every month:
1% of $2,000, or $20 ($2,000 x .01 = $20)

Interest paid over a year:
$240 ($20 per month for 12 months)

At end of loan term:
Motorcycle cost: $2,000 | Interest paid: $240

Total motorcycle cost: $2,240
($2,000 principal + $240 interest)

$2,000
Motorcycle Cost

$240
Interest Paid

Accrued interest is the amount of interest that the lender earns during some period, or the interest someone owes you if you are the lender. To convert an annual interest rate to a monthly interest rate, simply divide the annual rate by 12 since there are 12 months in a year. In this case, your Uncle Jim will earn 1% per month in interest (12% / 12 months = 1% per month). The interest that accrues every month is 1% of $2,000, or $20 ($2,000 x .01 = $20). Over the year, you will pay Uncle Jim $240, $20 per month for 12 months, to borrow the $2,000. At the end of the loan term, you will repay the original $2,000. In total, the motorcycle will cost you $2,240 ($2,000 principal + $240 interest).

To summarize, you will pay $240 in interest to borrow the money, and your Uncle Jim will make $240 in interest for loaning you the money. As we go through this lesson, keep in mind that the interest rate picture has two sides: borrowers and savers (lenders).

<u>Example 2</u>: Assume you didn't buy the motorcycle and waited until graduation to get the $2,000 your grandma promised you. Further, assume you managed to save another $500 on your own. Now, what do you do with that $2,500 if you decide you don't need the motorcycle? You can put the money in a bank account and let it begin working for you. After visiting several banks' websites, you find an online bank (one that has no physical branches) that will pay you a 2% return on your investment. How much interest will you earn in the first year on your $2,500 investment? **$2,500 x .02 = $50 in interest earned in the first year.**

💬 Discussion Topic: While some students would rather wait until they had $2000, up front to buy a motorcycle, others might think $20 a month is a small price to pay to drive a motorcycle to school every day of their senior year. Ask your students what they would prefer and why, recalling the decision-making process and subjective value.

Monetary Policy and Its Effect on Interest Rates

The government affects interest rates not only through its borrowing activity but also through monetary policy carried out by the central bank of the United States, or the Federal Reserve Bank (the Fed). The Fed conducts monetary policy designed to increase economic growth and keep prices from increasing too fast.

Monetary policy includes any action the Fed takes to accomplish these goals. The most common Fed action is to increase or decrease interest rates through changing the supply of money. If the Fed wants to increase economic growth, it lowers interest rates to encourage consumers and businesses to borrow money and spend it. If the Fed wants to keep prices from rising too fast, then it will increase interest rates to discourage borrowing and spending.

A sustained increase in the general level of prices is called inflation. When the same basket of groceries that cost you $100 in 2018 costs $102 in 2019, you're experiencing the effects of inflation. Because inflation reduces the purchasing power of money, lenders want to earn interest rates that are higher than the inflation rate.

For example, mortgage interest rates for a typical 30-year fixed rate mortgage were below 4% at the end of 2019. In 1981, mortgage rates were about 19%. Why the big difference? Inflation rates in 2019 were about 2%, while they were over 10% in 1981. If a bank loaned money at an interest rate below the inflation rate, the bank would be receiving loan payments in dollars that would not be worth as much.

1981
19%
Interest Rate

2019
4%
Interest Rate
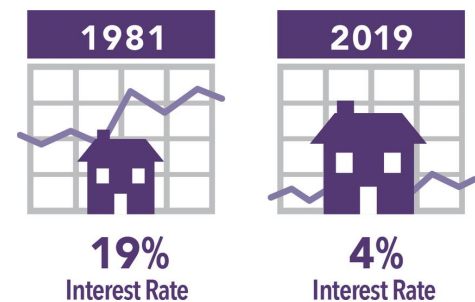
> **Discussion Topic:** How do interest rates affect the size of the home you can buy?
> Answer: When interest rates are lower you can buy a more expensive home without having a larger payment. For example, a 1% drop in interest rates can lower your payment by $200 to $300 a month or more if the home is very expensive. When this occurs, many homebuyers will choose to buy a larger home instead of reducing the monthly amount they expected to pay.

These factors affecting the supply and demand for money all work together to cause interest rates to change almost daily. When interest rates change, it affects us in different ways. For example, if I save a lot of money and keep it in the bank, then higher interest rates are good for me since I will earn more money on my deposits. Many people who are in or near retirement would prefer to see higher interest rates since they have already made most of the big purchases of their lifetimes and locked in their interest rates or paid off their debts. Now they have savings in the bank that they intend to live off of during retirement, and they want that savings to earn as much interest as possible.

In contrast, younger people often borrow large sums to buy cars and houses and pay for education. They like to see lower interest rates that reduce their borrowing costs and lower their payments. When interest rates are low, they can borrow more money and keep their payment the same, or borrow the same amount of money and have a lower payment.

As you can see, lower interest rates are good for borrowers and bad for savers. Higher interest rates are bad for borrowers and good for savers. Whether you want interest rates to rise or fall depends on which group you fall into. Are you a borrower or a saver? Many people are both.

One way to determine the borrower's cost of higher interest rates is to compute how much additional interest they will pay over the life of a loan. In the following table, you can see the difference in total interest paid over the life of a home loan, or mortgage, at different interest rates.

Exercise #2 | STUDENT VERSION

Changing Interest Rates & How They Affect Us

(20–30 minutes)

Name _____ Date:_____ Class Period: _____

Interest rates move up and down daily. While daily fluctuations in interest rates may not have a big impact on borrowers or lenders in the short run, they can have a big impact over time. Each of the following scenarios outlines a change in interest rates that will affect a borrower or saver (lender) in some way. Identify the impact and make some recommendations about what each person should do in that situation.

Read each of the following scenarios and then answer the questions associated with each one. Consider other alternatives for the borrowers in each scenario. Students may work individually or in groups.

Scenario 1: Mr. Hernandez borrowed $150,000 to buy his house. He purchased the home four years ago and financed it with a 5/1 ARM at a 4% initial interest rate. Given that his initial fixed interest rate period is about to expire, he is trying to decide what to do. Should he refinance? Stick with his loan? The current interest rates on mortgages are 3.75% on a 30-year fixed rate mortgage and 3.45% on another 5/1 ARM.

1. What factors should Mr. Hernandez consider in his decision?

2. What risks does Mr. Hernandez face if he decides to keep his current loan?

3. What advice would you give Mr. Hernandez?

Exercise #4 | STUDENT VERSION

Graphing Interest Rates

(20–30 minutes)

Name _____ Date:_____ Class Period: _____

Create a bar graph comparing national average interest rates vs. best available interest rates using the given percentages, then answer questions provided.

National Average Interest Rates vs. Best Available Interest Rates

█ **National average annual interest rates, week of January 13, 2020**

Interest checking accounts: 0.05%
Savings accounts: 0.09%
12-month CDs: 0.49%
3-year CDs: 0.75%

Source: FDIC. www.fdic.gov/regulations/resources/rates/

█ **Best Available Rates from Bankrate for the Same Products**

Interest checking accounts: 1.75%
Savings accounts: 2.00%
12-month CDs: 2.15%
3-year CDs: 2.53%

Source: Bankrate. www.bankrate.com

1. Why do you think the average interest rates are low compared to the best available rates?

2. Why are online rates higher than rates offered by traditional banks?

3. If you had $500 in your savings account at your traditional bank earning 0.09% interest, how much extra would you earn in interest over one year by switching to a 2% online savings account?