



# FULL WALLET

The focus of this workshop will be on interest rates and your credit score applied to car purchases.

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**MATH  
WHISPERER**  
*Where math makes sense*

You deserve a full wallet, today and for the rest of your life. A full wallet means comfort and security. It comes when your income is enough to both cover your expenses and emergencies and your future. Tonight's information will provide you with many of the tools you can use to fill that wallet!



## **Schedule:**

6:30 – 7 dinner and welcome - with Marsha Golden

7:00 – 7:10 What's interesting about interest rates - with Bernice German, Math Whisperer

7:10 – 7:20 What's critical about your credit score, made easy – with Alisa Page, Branch Manager, First National Bank

7:20 – 7:30 The lowdown on car leases – with Alisa and Bernice

7:30 – 7:35 Conclusion – with Marsha

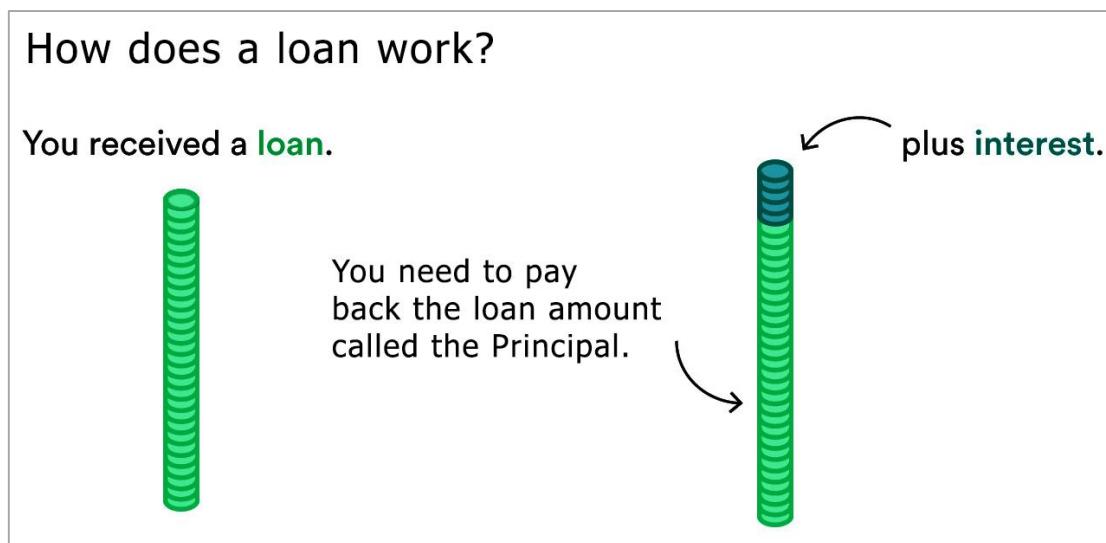
## The only math you need:

You can understand most things about car purchases by understanding “percent rates.” There are two parts to this, “percent” and “rate.” Both of these are math concepts. As the Math Whisperer, I would love to help you understand these in depth. But for the purposes of this workshop, I am going to simply explain them so that they make enough sense for you to use them. Some additional explanation is located on the last pages.

The **interest rate** is the most important for you to understand, so that is what we will focus on.\*

### What is **interest**?

If you want to borrow money, you have to pay the lender back something more than just the exact amount you borrowed. The extra money you pay the lender is called “**interest.**” The borrower pays the lender back the principal, which is the original amount borrowed, and the **interest.**



The amount of interest the borrower pays back to the lender is a percent of the principal borrowed.

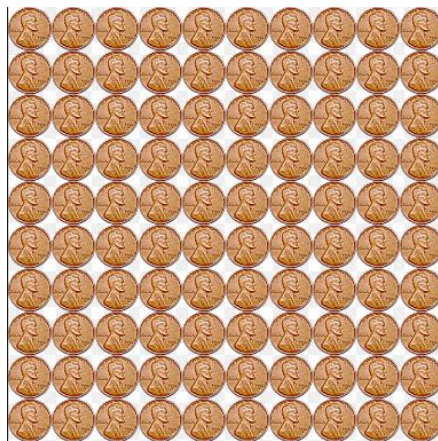
\*Interest rates turn out to be extraordinarily important in creating a full wallet. I was surprised myself at what a difference they make when I prepared this information. The difference between retiring with a million dollars or zero can be accomplished by paying attention to interest rates. An example of the potential contribution of interest rates with car loans to a million dollars at retirement is at the back.

What is a **percent**? Per means “for each.” Cent means 100. For example a century is 100 years. There are 100 cents (pennies) in a dollar. So “per cent” means “for each hundred.”

One hundred pennies

=

One dollar



=



One penny equals 1% of a dollar (0.01 of a dollar)

Examples: The higher your interest rate, the more interest money you have to pay back.

### Example 1

Interest: **5%**

You borrow \$1.00

At 5% interest you pay back \$1.05



$$\text{Interest} = \text{principal} \times \text{interest percent} = \$1.00 \times 0.05 = 5 \text{ cents}$$

### Example 2

Interest: **19%**

You borrow \$1.00

At 19% interest you pay back \$1.19

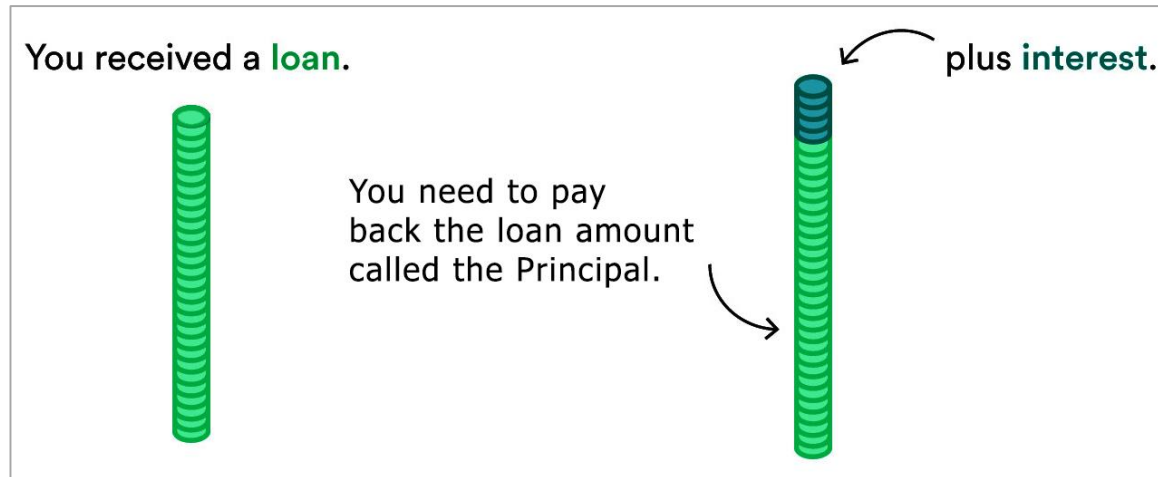


$$\text{Interest} = \text{principal} \times \text{interest percent} = \$1.00 \times 0.19 = 19 \text{ cents}$$

These two examples demonstrate that a lower interest rate means you pay back less!

Examples: The more you borrow, the more interest you pay back.

Say the interest percent is 10%.



\$100 borrowed, 10% interest,  
borrower repays \$100 (the principal) + \$10 (the interest) = \$110.

\$400 borrowed, 10% interest,  
borrower repays \$400 (the principal) + \$40 (the interest) = \$440.

The big idea: These two examples demonstrate that the more you borrow the more interest you pay.



## Example 1: 5% interest

Interest amount = Principal x Interest = Principal x (0.05)

You borrow \$1,000

**\$1,000**  
the principal

You pay back \$1,050

**\$1,000**  
the principal

 + 

**\$50**  
Interest

You borrow \$2,000

**\$2,000**  
the principal

You pay back \$1,100

**\$2,000**  
the principal

 + 

**\$100**  
Interest

You borrow \$3,000

**\$3,000**  
the principal

You pay back \$3,150

**\$3,000**  
the principal

 + 

**\$150**  
Interest

You borrow \$10,000

**\$10,000**  
the principal

You pay back \$10,500

**\$10,000**  
the principal

 + 

**\$500**  
Interest

You borrow \$30,000

**\$30,000**  
the principal

You pay back \$31,500

**\$30,000**  
the principal

 + 

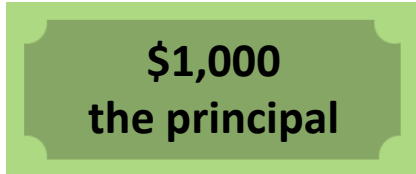
**\$1,500**  
Interest



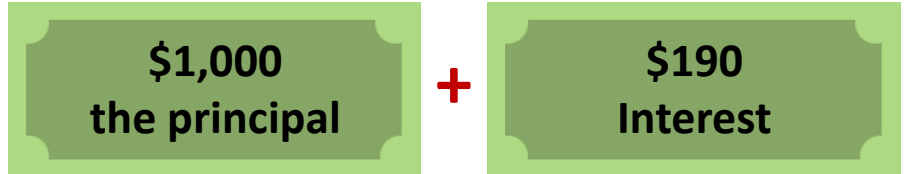
## Example 1: 19% interest

Interest amount = Principal x Interest = Principal x (0.19)

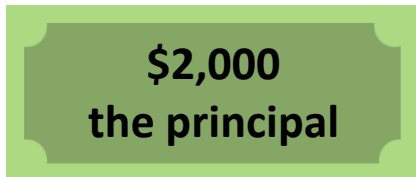
You borrow \$1,000



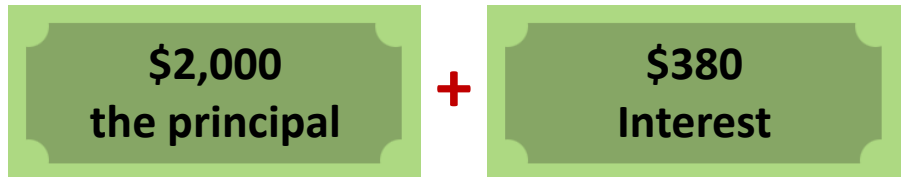
You pay back \$1,190



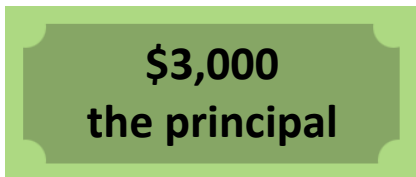
You borrow \$2,000



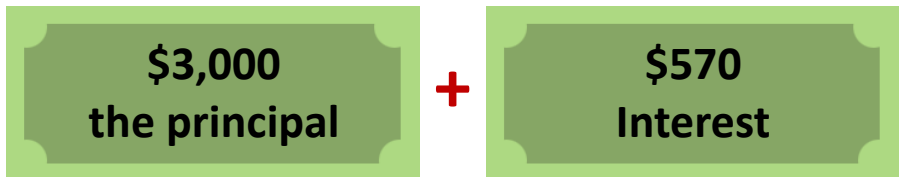
You pay back \$2,380



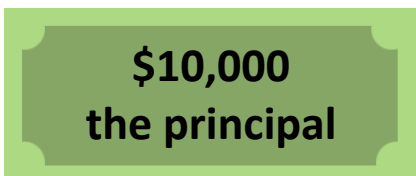
You borrow \$3,000



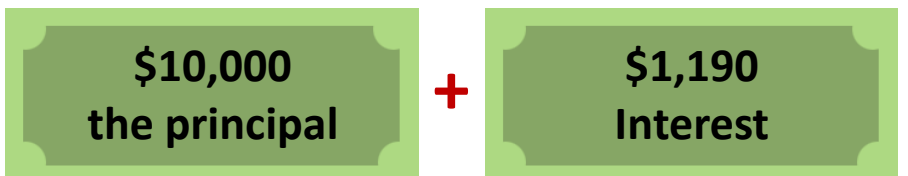
You pay back \$3,570



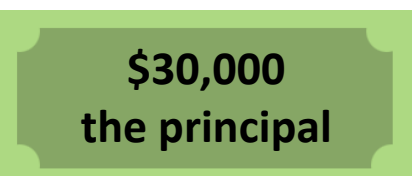
You borrow \$10,000



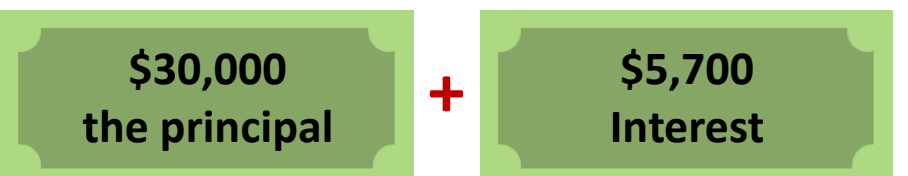
You pay back \$11,900



You borrow \$30,000



You pay back \$35,700





## What is **interest rate**?

There are two parts to the phrase “interest rate,” which are “interest” and “rate.” The “rate” part is about the amount of time it takes for the borrow to repay the lender. The **interest rate** is typically given for one year.

As an example, a 10% interest rate means the borrow pays the lender 10% of what he or she owes each year.

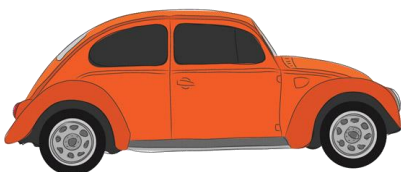
**Simple interest** means it is the most simple (easy) way to calculate interest.

Note: Banks and other lenders generally use more complicated ways to charge interest, which make them more money. This short lesson is about simple interest.

I am going to give a couple of short examples of how this works.

Simple interest = (principal) \* (interest rate) \* (number of periods)

Next we have 4 examples to demonstrate how interest rates affect how much you pay back.



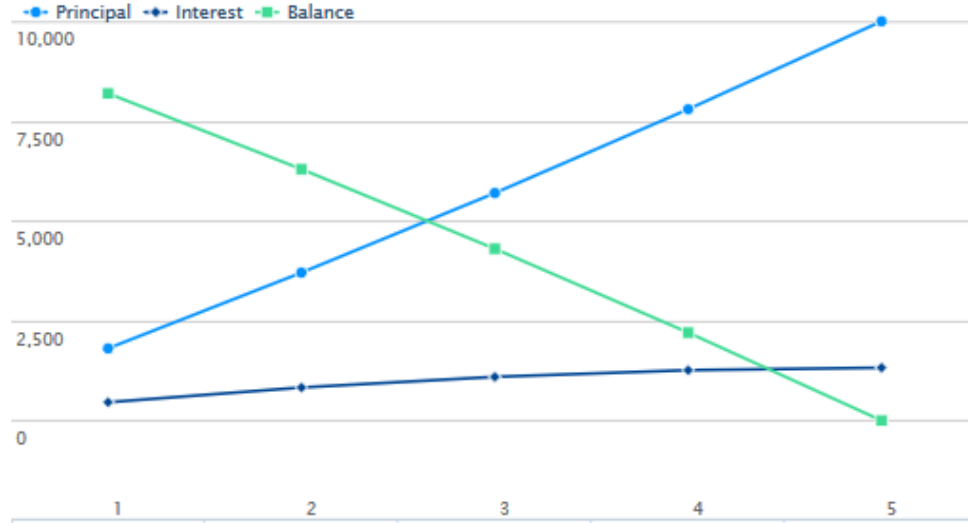
# Amortization Calculator

- 1 Loan Amount **\$10,000**
- 2 Interest Rate **5%**
- 3 Number of Years **5 years**

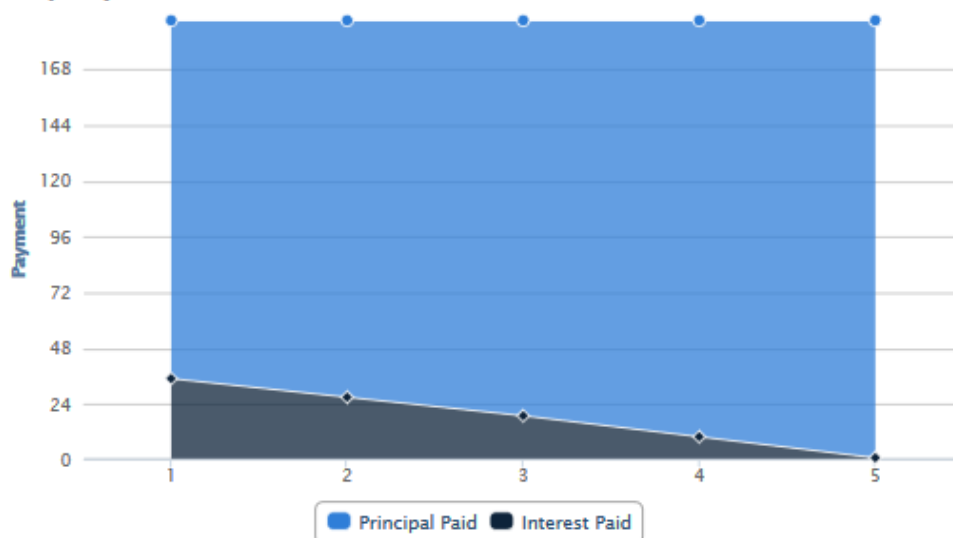
Monthly Principal & Interest	Number of Payments	Total Payments	Original Loan Amount
\$189	60	\$11,323	\$10,000

## Additional amortization information

**Loan Amortization Chart**



**Principal Payment Chart**

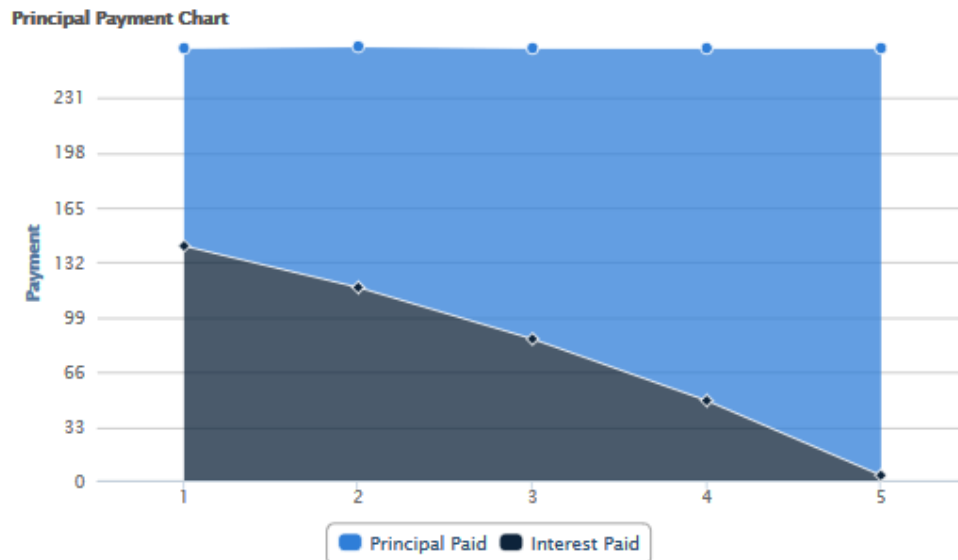


# Amortization Calculator

- 1 Loan Amount **\$10,000**
- 2 Interest Rate **19.4%**
- 3 Number of Years **5 years**

Monthly Principal & Interest	Number of Payments	Total Payments	Original Loan Amount
\$262	60	\$15,697	\$10,000

## Additional amortization information

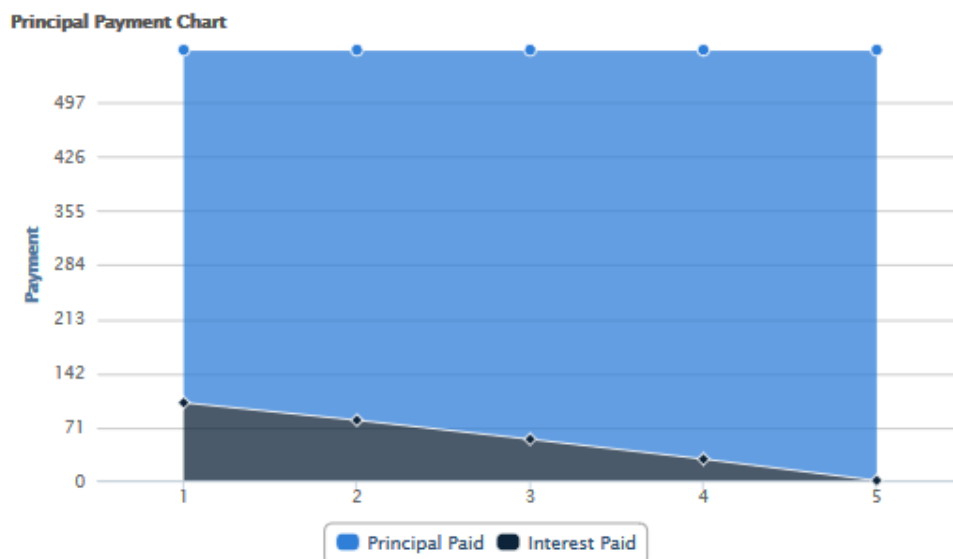
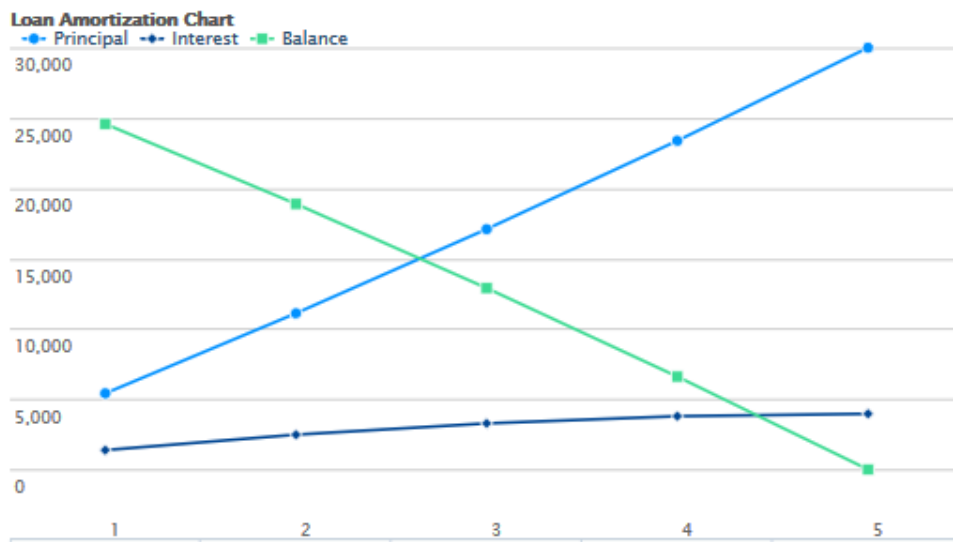


# Amortization Calculator

- 1 Loan Amount **\$30,000**
- 2 Interest Rate **5%**
- 3 Number of Years **5 years**

Monthly Principal & Interest	Number of Payments	Total Payments	Original Loan Amount
\$566	60	\$33,968	\$30,000

## Additional amortization information

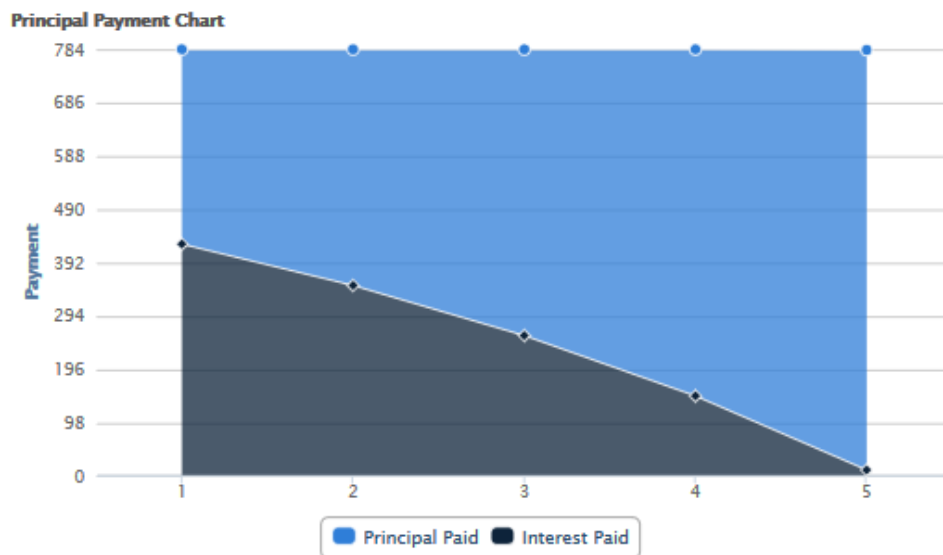


# Amortization Calculator

- 1 Loan Amount **\$30,000**
- 2 Interest Rate **19.4%**
- 3 Number of Years **5 years**

Monthly Principal & Interest	Number of Payments	Total Payments	Original Loan Amount
\$785	60	\$47,090	\$30,000

## Additional amortization information



## Dictionary

**Principal:** The original amount borrowed

**Interest:** If you want to borrow money, you have to pay the lender something. What you pay the lender is called “interest.” The borrower pays the lender back the principal (the original) amount borrowed, and the interest.

**Rate:** A rate is a ratio, a fraction, like  $\frac{a}{b}$ . The fraction bar is read as “per.”  
Examples are:

Heart rate =  $\frac{\text{number of beats of your heart}}{\text{minute}}$       Number of heartbeats per minute

Rate of speed =  $\frac{\text{miles}}{\text{hour}}$       Miles per hour

**Interest rate:** The interest rate is the amount charged to the lender, calculated as a percentage of principal. The interest rate is usually quoted as an annual rate. However, interest can be calculated for periods longer or shorter than one year. There are many ways interest can be calculated, and it’s important to know how your interest rate is being calculated, as it may be more than you realize.

**Interest rate** =  $\frac{\text{interest percent}}{\text{year}}$       Interest percent per year  
Nicknamed Annual Percentage Rate or APR

**Percent:** Per means “for each.” Cent means 100. For example a century is 100 years. There are 100 cents (pennies) in a dollar. So “per cent” means “for each hundred.”

**Percent of:** Percent is defined above. “Of” means to multiply. For example, 3 x 4 means 3 groups of 4. So “percent of” means to multiply the percent times the principal.

**Appreciation:** Appreciation is when something is recognized as valuable. We appreciate our friends, and hopefully, they become more valuable to us over time. With cars, appreciation means the car becomes more valuable, i.e. worth more money, each year. This almost never happens, except with certain vintage cars.

**Depreciation:** Depreciation is the opposite of appreciation. Depreciation is when something becomes less and less valuable over time. Cars almost always depreciate, meaning they become less and less valuable as each year goes by. That makes sense – the car is getting older and newer models are coming out with more features. Depreciation is given as a percentage rate. A typical depreciation rate is 20% per year. Yikes! See examples on page 16 and 17

**Sales tax:** This is another percentage rate. Sales tax is generally in the range of 3% to 11%. Often the sales tax is added to the cost of the car, and becomes part of the loan amount.

**Percent vs Percentage:** They mean the same thing. There is a complicated grammar rule on when to use each. However, I don't understand it and neither do most authors.

**Pre-payment penalty:** This means the lender charges the borrower for paying off the loan early. This punishes the borrower. It is important to ask the lender if there is a pre-payment penalty

## DEPRECIATION EXAMPLE

Car value = Last year's value – (depreciation rate) x last year's value

Example 1. \$10,000 car

Year 1



$$\$10,000 - \$2,000 = \$8,000$$

**\$2,000 the depreciation**  
 $\$10,000 \times (0.20) = \$2,000$

Year 2



$$\$8,000 - \$1,600 = \$6,400$$

**\$1,600 the depreciation**  
 $\$8,000 \times (0.20) = \$1,600$

Year 3



$$\$6,400 - \$1,280 = \$5,120$$

**\$1,280 the depreciation**  
 $\$6,400 \times (0.20) = \$1,280$

Year 4



$$\$5,120 - \$1,024 = \$4,096$$

**\$1,024 the depreciation**  
 $\$5,120 \times (0.20) = \$1,024$

Year 5



$$\$4,096 - \$819 = \$3,277$$

**\$819 the depreciation**  
 $\$4,096 \times (0.20) = \$819$



## DEPRECIATION EXAMPLE

Car value = Last year's value – (depreciation rate) x last year's value

Example 2. \$30,000 car

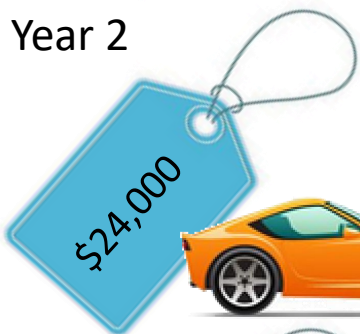
Year 1



$$\$30,000 - \$6,000 = \$24,000$$

**\$6,000 the depreciation**  
 $\$30,000 \times (0.20) = \$6,000$

Year 2



$$\$24,000 - \$4,800 = \$19,200$$

**\$4,800 the depreciation**  
 $\$24,000 \times (0.20) = \$4,800$

Year 3



$$\$19,200 - \$3,840 = \$15,360$$

**\$3,840 the depreciation**  
 $\$19,200 \times (0.20) = \$3,840$

Year 4



$$\$15,360 - \$3,072 = \$12,288$$

**\$3,072 the depreciation**  
 $\$15,360 \times (0.20) = \$3,072$

Year 5



$$\$12,288 - \$2,458 = \$9,830$$

**\$2,458 the depreciation**  
 $\$12,288 \times (0.20) = \$2,458$

## Full Wallet



Here is a glimpse at how managing interest rates can make the difference between retiring with \$1million or \$0:

You can see that a higher interest rate makes a huge difference in how much money you have to repay. And when you consider that car loans are often for five years, this can be an enormous difference between a lower and a higher interest rate.

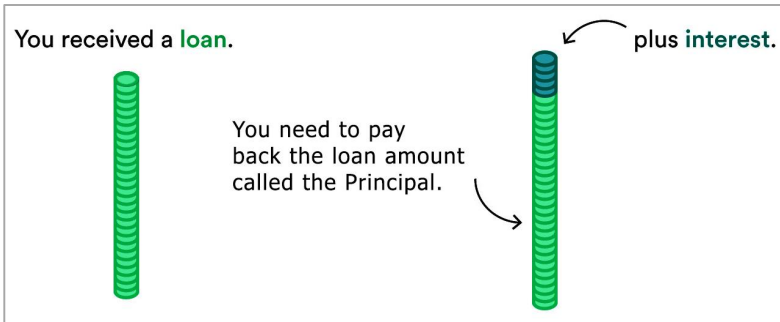
30k, 5 year loan, 5 %.      Total interest    \$3,968

\$30k, 5 year loan, 19.4%,    Total interest    \$17,090

This is a \$13,000 difference!!! If every 5 years you put that \$13k under your mattress, starting at age 25, by age 65 you would have \$104k. That is without making any investment. In reality, it would likely be several hundred thousand dollars, as you would invest that money. And when you add in credit cards and home mortgages, you are talking about many hundreds of thousands of dollars extra by one's fifties and sixties. And that is why we are here today – to help you and to help your children understand the importance of interest rates in taking care of your financial health and future.

## What's interesting about interest: the summary

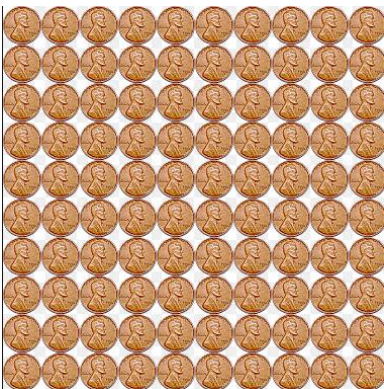
When you borrow money to purchase a car, you pay back the original loan amount (the principal) and interest. Interest is the extra money you have to pay back to the lender. Page 3



How the amount of interest is calculated: It is a percent of the principal. Page 5

What is a **percent**? Per means “for each.” Cent means 100. For example a century is 100 years. There are 100 cents (pennies) in a dollar. So “per cent” means “for each hundred.” Page 4

One hundred pennies = One dollar



=



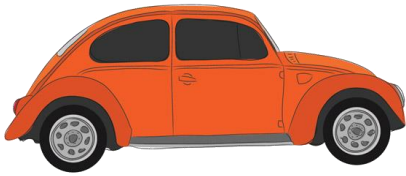
One penny equals 1% of a dollar (0.01 of a dollar)

## Conclusions:

The **higher** your **interest rate**, the **more** interest money you have to pay back.

The **more** you **borrow**, the **more** interest money you have to pay back.

Examples: All loans are for 5 years



\$10,000 car, **5%** interest      you will pay back      \$11,323, which is **\$1,323 of interest.**

\$10,000 car, **19.4%** interest      you will pay back      \$15,697, which is **\$5,697 of interest.**



\$30,000 car, **5%** interest,      you will pay back      \$33,968, which is **\$3,968 of interest.**

\$30,000 car, **19.4%** interest      you will pay back      \$47,090, which is **\$17,090 of interest.**

