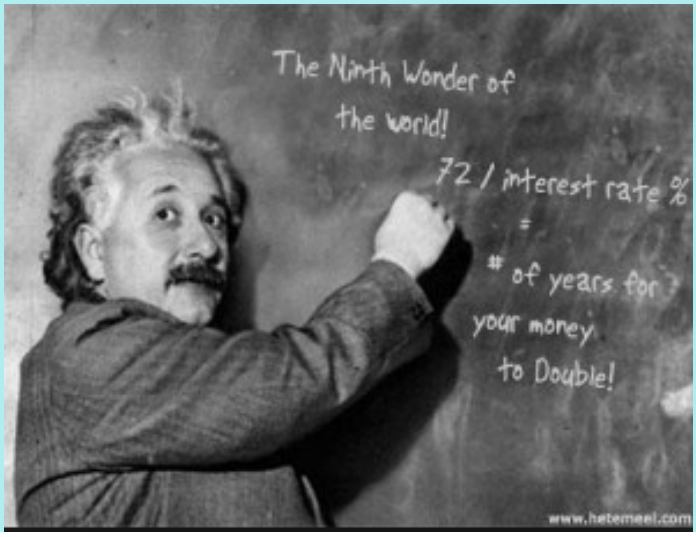
Math 110

Lesson 3G - SIMPLE INTEREST

LEARNING TARGET

I AM GOING TO LEARN ABOUT SIMPLE INTEREST AND HOW TO SOLVE PROBLEMS INVOLVING SIMPLE INTEREST.



Other than a savings or checking account

- What investment options do you know about?
- Why do some investments offer higher interest rates than others?
- What is a low-risk investment? a high-risk investment? Give an example of each.
- What relationship might there be between the interest rate and the risk involved?

Guaranteed Investment Certificate (GIC)

- an investment that is very low risk because the investment and any interest earned are guaranteed by the bank
- tend to pay higher rates of interest than bank accounts but lower rates than some other investments

term deposit

- an amount of money deposited for a fixed length of time
- there may be penalties for withdrawing the money before the end of the term

Simple Interest:

$I = prt$

I - interest p - present value r = rate of interest

t - time (length of time the money is invested)

Simple Interest

Basically, simple interest is interest paid on the original principal only

For example, 4000 dollars is deposited into a bank account and the annual interest rate is 8%.

How much is the interest after 4 years?

Use the following simple interest formula:

$I = p \times r \times t$

where p is the principal or money deposited

r is the rate of interest

t is time

We get:

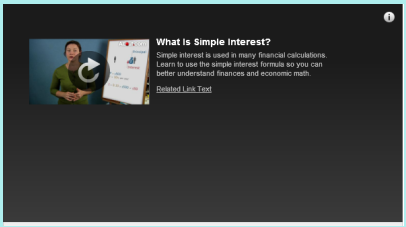
$I = p \times r \times t$

$I = 4000 \times 8\% \times 4$

$I = 4000 \times 0.08 \times 4$

$I = 1280$ dollars

Understanding the Time Value of Money



What is Simple Interest

simple interest
- interest that is paid once, generally at the end of the time period of the investment
- sometimes called *regular interest*

future value
- the value of an investment at the end of a certain time period
- also called the *final amount* (*A*)

present value
- the amount of money that is invested
- also called *principal*

Strategy

You can also convert the percent to a decimal number and multiply.

$I = 22\,000 \times 0.0195 \times 0.5$

On the Job 1

Simple Interest

Ron's business has an amount of cash available for investing. He does not want to tie up the money for a long period of time. He also does not want the money sitting in a bank account earning little interest. Ron takes $22 000 of the cash and buys a 6-month GIC that will pay **simple interest** at 1.95%.

a) What does it mean that the GIC will pay simple interest at 1.95%?

b) Interest rates are quoted as a percent per year. Calculate the interest earned.

c) Determine the **future value** of Ron's investment.

Solution

a) A 1.95% interest rate means that Ron's financial institution will pay 1.95% of the invested amount per year.

Interest rates are always quoted per year.

b) To calculate simple interest, multiply the **present value** by the interest rate by the length of time the money is invested.

Use the formula $I = P \times r \times t$, where
I is the simple interest
P is the present value
r is the interest rate
t is the length of time the money is invested

Since interest rates are quoted as a percent per year, time must also be stated in years. In this case, Ron invested for 6 months, which is $\frac{1}{2}$ year or 0.5 years.

$I = P \times r \times t$
$= 22\,000 \times 1.95\% \times 0.5$
$= 214.5$

C 22000 × 1.95 2nd % × 0.5 =
214.5

The interest earned is $214.50

c) The future value of this investment is what Ron originally invested plus the interest that it earned. Calculate the future value using the following formula:

$FV = P + I$
$= 22\,000 + 214.50$
$= 22\,214.50$

You may see this formula written as $A = P + I$, where
A is the final amount
P is the principal
I is the interest earned

The future value of Ron's investment is $22 214.50.

On the Job 1

Simple Interest

Your Turn

a) Use the simple interest formula to determine the interest earned on a $1000 GIC paying 2.1% interest for 3 years.

b) Calculate the future value of the GIC 3 years from today.

Math 110 Assignment 3G - Simple Interest

Simple Interest

Formula: $I = Prt$

Where:
I = interest earned
P = principle amount (initial)
r = rate (as a decimal ! Divide by 100)
t = time (*years)

Example 1: Calculate the interest earned of $3000 over a 4 year period at 5%.

I =

P =

r =

t =

Example 2: Determine the interest earned of $560.00 at 2.5% over a 10 year period.

I =
P =
r =
t =

Example 3: What is the amount in the account if $2,457.16 collects simple interest for 6 months at 7%?

I =
P =
r =
t =

You Try!

a) $2000 at 8% for 5 years

b) $962 at 4.25% for 2.5 years

c) $200,000 at 3% for 15 months

Recall Converting Time Measurements:

Conversion Factors: *1 year = 365 days or 1 year = 12 months*

Convert the following to years:

a) $126\ days \times \frac{1\ year}{365\ days} =$

b) $26\ months \times \frac{1\ year}{12\ months} =$

You try ☺ Convert the following to years:

1. 200 days
2. 10 months
3. 40 months
4. 720 days

Simple Interest Practice

1. Calculate the simple interest for each question below:

Principle	Rate	Time	Work	Answer
a) $3000	2%	4 years		
b) $250	5%	3 years		
c) $5000	3.5%	6 years		
d) $4750	6.25%	500 days		
e) $15,750	8.2%	9 months		

2. Calculate the TOTAL amount owed if money is borrowed on simple interest. (Calculate "I" first, then add to P)

Principle	Rate	Time	Work	Answer
a) $50,000	5%	10 yrs		
b) $10,500	7%	5 yrs		
c) $350,000	6.5%	20 yrs		
d) $100,000	7.25%	16 months		
e) $40,000	8.85%	30 days		

3. John borrows $19,500 from a bank for a car. He pays 7.5% over 4.5 years. What is the **total** he must pay back?

4. Mary deposits $5000.00 in a savings account that earns 3.25% and leaves it there for 250 days. What is the interest?

Attachments

- Compound and Simple Interest
- Compounding Interest
- What is Simple Interest
- Compound Interest Formula
- How to Calculate Compound Interest
- Understanding the Time Value of Money