

Date _____

Name _____

9.2.1 Compound Interest

Suppose you strike a deal with the investment officer at your bank. You negotiate investing \$1000 at 2.5% simple interest for 6 years BUT (here is where your expert negotiating skills come in) you talk the bank into calculate the interest after each year and adding it to your balance moving forward. Use the table to help you determine the value of your investment after 6 years.

Interest Table			
Interest Period	Investment value at beginning of period	Interest earned ($I = Prt$)	Investment value at end of period
1			
2			
3			
4			
5			
6			

_____ is a type of interest that is calculated on the _____ any interest previously earned. In the example above, you invested your money for six years but earn interest annually, the second year of interest was calculated on the value of the investment after one year; that is, on the principal plus one year of interest and so on. You will earn more interest than would be earned at simple interest! (Clever negotiator😊)

As with simple interest, compound interest is stated as a _____. If the interest is compounded annually, this means that the interest is applied to the account once a year.

Compound interest often happens over periods other than years. We will look at that next day. For today, we will focus on compound interest with ANNUAL compounding periods.

Compound interest is calculated using the following formula.

A _____

P _____

r _____

n _____

t _____

1. Calculate the interest you would earn on \$1000.00 deposited in an account that pays 4.00% interest per annum, compounded annually if you left it for 2 years.
2. Compare the amount you earned in #1 to what you would get with simple interest.
3. Calculate the final value of a deposit of \$5000.00 invested at 3.00% per annum, compounded annually, for 2 years.

What is the Rule of 72?

If you are investing your money, you may try to estimate how much interest you will earn over the term. There is an easy way to estimate how long it will take you to double your investment if it is compounded annually. It is called the **Rule of 72**. The approximate time in years is calculated by dividing 72 by the interest rate expressed as a percent.

Rule of 72

Years to double investment = $72 \div (\text{interest rate as a percent})$

Remember this is an estimate!

4. Approximately how long will it take an investment of \$5000.00, invested at a rate of 3.75% per annum, compounded annually, to double in value?

5. Use the Rule of 72 to estimate how long it would take the following investments to double in value:
 - a) \$6000.00 invested at 4.00% per annum, compounded annually;

 - b) \$1000.00 invested at 2.45% per annum, compounded annually; and

 - c) \$1000.00 invested at 1.95% per annum, compounded annually.

6. If you wanted to double your money in 15 years, at what rate of interest would you need to invest your money?