Chapter 8

Owning a Small Business

Section 8.1

Start a Small Business

Lesson 1:

Compound Interest

In this chapter, you will calculate the costs of operating a business. Businesses often need to take out loans to cover costs. To calculate the total cost of a loan, you need to calculate **compound interest**. Compound interest is calculated on the **principal**, plus any interest previously earned. For example, if you borrow money for two years but interest is compounded annually, the second year of interest will be calculated on the principal plus one year of interest.

In this chapter, you will calculate the costs of operating a business. Businesses often need to take out loans to cover costs. To calculate the total cost of a loan, you need to calculate **compound interest**. Compound interest is calculated on the **principal**, plus any interest previously earned. For example, if you borrow money for two years but interest is compounded annually, the second year of interest will be calculated on the principal plus one year of interest.

compound interest: interest calculated on the principal plus interest accumulated in prior compounding periods

In this chapter, you will calculate the costs of operating a business. Businesses often need to take out loans to cover costs. To calculate the total cost of a loan, you need to calculate **compound interest**. Compound interest is calculated on the **principal**, plus any interest previously earned. For example, if you borrow money for two years but interest is compounded annually, the second year of interest will be calculated on the principal plus one year of interest.

compound interest: interest calculated on the principal plus interest accumulated in prior compounding periods

principal: the original amount of money borrowed

The formula for compound interest is:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

A is the amount of money you have to repay for the loan.

P is the principal (the amount you borrowed).

r is the annual interest rate as a decimal.

n is the number of **compounding periods** per year.

t is the **term** of the loan in years.

compounding periods: the time between calculations of interest

compounding periods: the time between calculations of interest

"annually" or "per annum"	=	once per year
"semi-annually"	=	twice per year
"monthly"	=	12 times per year
"quarterly"	=	4 times per year

term: the length of time over which money is borrowed

term: the length of time over

which money is borrowed

Term lengths need to be in "years" for the compound interest formula calculations.

term: the length of time over

which money is borrowed

Term lengths need to be in "years" for the compound interest formula calculations.

If term lengths are stated in months, convert the number to years by dividing by 12.

term: the length of time over

which money is borrowed

Term lengths need to be in "years" for the compound interest formula calculations.

If term lengths are stated in months, convert the number to years by dividing by 12.

EX: **60 months = 60/12 = 5 years**
6 months = 6/12 = 0.5 years
18 months = 18/12 = 1.5 years
etc.

Example 1

Principal (P)

Rate (r)

Michel takes out a loan for $2000.00, borrowed at an interest rate of 3.00% per annum, compounded monthly for 2 years.

Compounding Frequency (n)

Term (t)

$P = 2000$

$t = 2$

$r = 3.00\% = 0.03$

$n = 12$

a) How much will Michel repay in total for the loan if he makes no payments until the end of the term?

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 2000\left(1 + \frac{0.03}{12}\right)^{(12)(2)}$$

$$A = 2000\,(1.0025)^{24}$$

$$A = \$2123.51$$

b) If he makes monthly payments of $85.96, how much will he repay on the loan?

$85.96 × 24

= $2063.04

c) For the option in b), how much would he pay in interest?

$2063.04 - 2000.00

= $63.04 in interest