FMP10 Name: _____
Date: _____

Unit 7: Personal Finance
7.3 Compound Interest

Interest: Money earned on an investment OR money owed on a loan

Simple Interest

- Interest calculated as a percentage of the original amount

$$I = Prt$$

$I = interest$
$P = principal\ (original\ amount)$
$r = rate\ (yearly)$ in decimal form
$t = time\ (years)$

7.2%/a

Ex. Calculate the simple interest earned on a $2000 investment for 2 years at 7.2% per annum.

$I = Prt$
$I = (2000)(0.072)(2)$
$= \$288$

year

Compound Interest

- Interest is added on to the principal at preset periods (called compounding periods)

Ex. Track an investment of $1000 earning interest at 1% per annum compounded annually for 6 years.

Year 0 1 2 3 4 5 6

$1000, $1010, $1020.10, $1030.30, $1040.60, $1051.01, $1061.52

×1.01 ×1.01 ×1.01

$$A = P(1+i)^n$$

$1000(1.01)^6$

$A = total\ amount\ (not\ just\ interest)$
$P = principal\ (original\ amount)$
$i = interest\ rate\ \boldsymbol{per}\ compounding\ period$
$n = total\ number\ of\ compounding\ periods$

Ex. Calculate the interest earned on a $2000 investment for 3 years at 7.2%/a compounded semi-monthly.

24 compounds/a

$i = \frac{0.072}{24} = 0.003$

$n = 24(3) = 72$

$A = 2000(1.003)^{72}$

$= \$2481.40$

$- 2000.00$

interest $481.40

Ex. Calculate the final value of a $5000 investment after 10 years at 8%/a compounded quarterly.

4 compounds/a

$i = \frac{0.08}{4} = 0.02$

$n = 4(10) = 40$

$A = 5000(1.02)^{40}$

$= \$11,040.20$

Ex. You need to borrow $15,000 which you will pay back after 2 years. Which of the following options should you take?

Option A: 12%/a compounded annually

$i = 0.12$

$n = 2$

$A = 15000(1.12)^2$

$= \$18816$

(extra $3816 in interest)

Option B: 11.7%/a compounded bi-weekly

26 compounds/a

$i = \frac{0.117}{26} = 0.0045$ ← NEVER !!! round i

$n = 26(2) = 52$

$A = 15000(1.0045)^{52}$

OR

$15000\left(1 + \frac{0.117}{26}\right)^{52}$

$= \$18944.72$

(extra $3944.72 in interest)

Option A is better because of less interest to pay back

Practice: Personal Finance Duotang pg. 542/18 – 30, 32, 33