Simple and Compound Interest

INTEREST???

- **What is Interest?**
  Money that is added to an investment/loan.

- **Investments (money is earned)**
  "Good interest"
  - **savings account (very, very small interest)**
      - **RRSP (registered retirement savings plan)**
  - **RESP (registered educational savings plan)**
  - **Canada Savings Bonds**
  - **GIC's (guaranteed investment certificate)**
  - **Tax Free Savings Accounts**
  - **Mutual Funds**
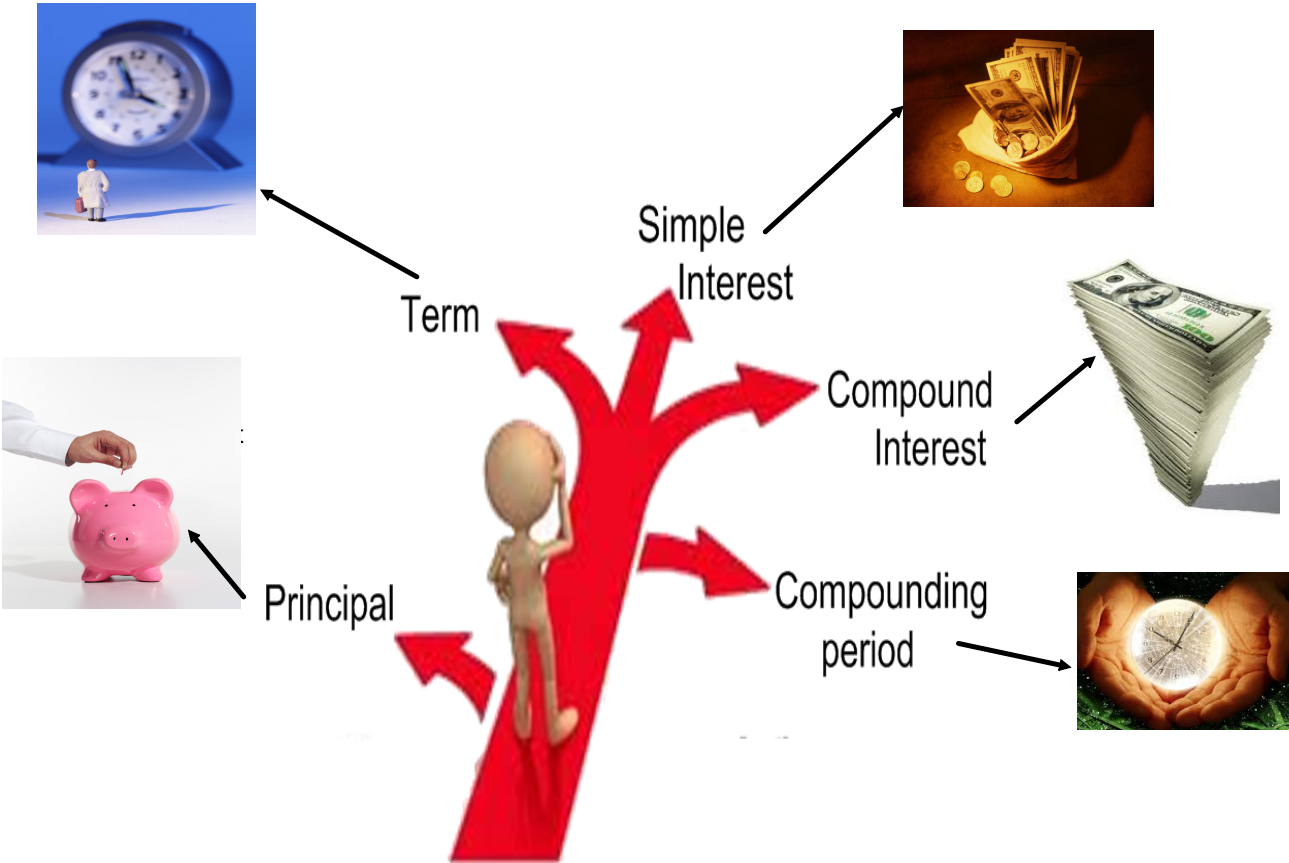 - **Stock Market (no interest, shares)**

- **Loans (money owed)**
  "Bad Interest"
  - **banks (line of credit, personal loans, mortgage)**
  - **business/stores**
  - **credit cards**
  - **Student Loans**
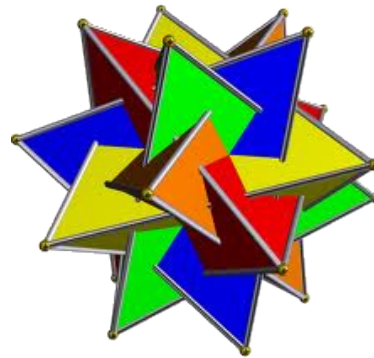
INTEREST - What is a good # ?

- **bank: 7-10 %**
- **business: 14 - 20%**
- **credit card (9 - 25 %)**

Term

Principal

Simple
Interest

Compound
Interest

Compounding
period

SIMPLE

COMPOUND

SIMPLE Interest

Based on the **principal** (original amount) that is invested/borrowed. Interest is a certain percentage per **annum** (year). Often used for personal loans and short-term investments. The length of time for the investment/loan is called the **term**.

$$\text{Interest} = \text{Principal} \times \text{rate} \times \text{time}$$

$$I = Prt$$

$$I = Prt$$

&

$$A = P + I$$

- I - interest earned
- P - principal (original investment/loan)
- r - interest rate as a percent **(change to a decimal)**
- t - is ALWAYS time in **years**

(how long the money is invested/borrowed)
- **A - amount of money including interest**

SIMPLE

Interest

$$I = Prt$$

Time must be in YEARS!!!

Represent each amount of time in years.

3 months

27 weeks

62 days

8 years

Gordon wants to invest $2000.00. His bank offers an investment option that earns <mark>simple interest</mark> at a rate of 1.75% per year.

$$I = Prt$$

$$I = (2000.00)(0.0175)(1)$$

$$I = \$35.00$$

Gordon wants to invest $2000.00. His bank offers an investment option that earns simple interest at a rate of 1.75% per year for ~~1~~ 3 years.

$$I = Prt$$

$$I = (2000.00)(0.0175)(\cancel{1})(3)$$

$$I = \$105.00$$

EXAMPLE #2: You borrowed $500 from your older brother who charges 4.5 % per annum. How much will you owe him after 2 years?

I = Prt
I = (500)(0.045)(2)
I = $45

A = P + I
A = 500 + 45
A = **$545**

EXAMPLE #3:

Betty-Ann's bank offers a simple interst rate of 4% per annum. How much interest would Betty-Ann earn on her investment of $4000 after 8 months.

$$I = Prt$$

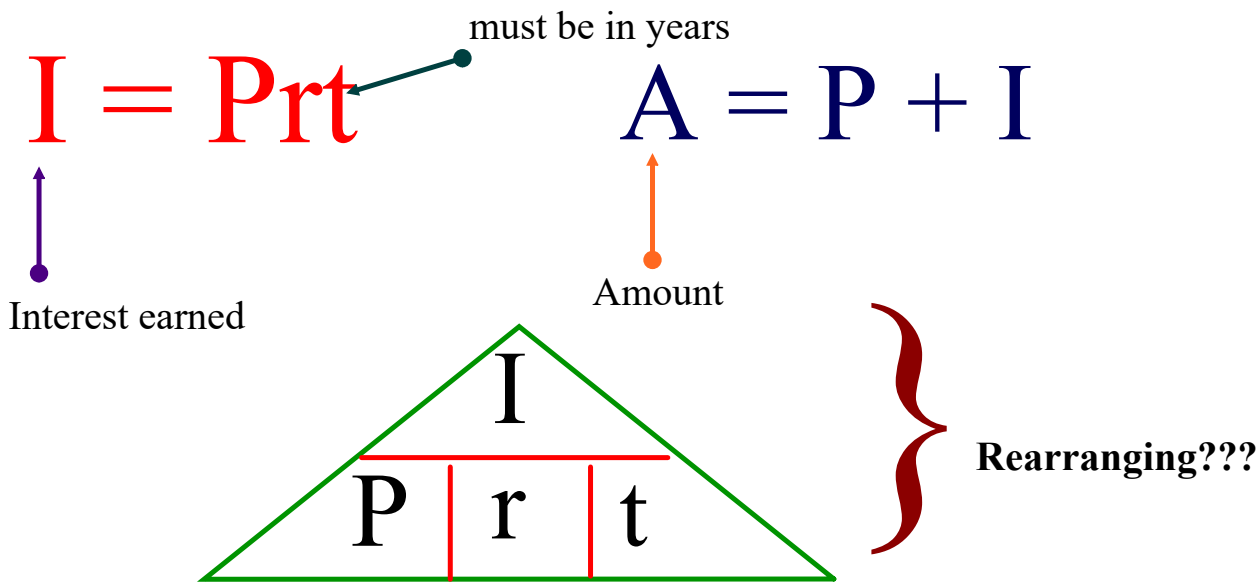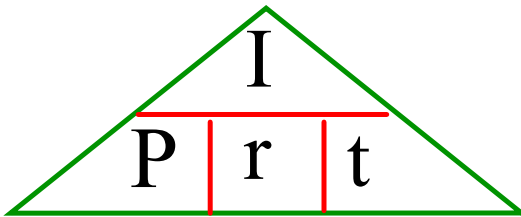$$I = 4000 \, (0.04) \, (8/12)$$

$$I = \$106.67$$

Time

$$I = Prt$$

must be in years

$$A = P + I$$

Interest earned

Amount

$$\} \quad \textbf{Rearranging???}$$

$$P = \frac{I}{rt} \qquad r = \frac{I}{Pt} \qquad t = \frac{I}{Pr}$$

$$= 0.05 = 5\%$$

EXAMPLE #4:

The interest earned on a deposit is $25
with an interest rate is 6% per annum.
If the money was invested for 2 years,
what is the principal?

KEEP IT
SIMPLE

$$P = \frac{I}{rt}$$

$$= \frac{25}{(0.06)(2)}$$

$$2 \text{ of. } 33$$

EXAMPLE #5: Liberty wants to earn $150 simple interest from a $1200 investment over 5 1/2 years. What rate does she need from the bank?
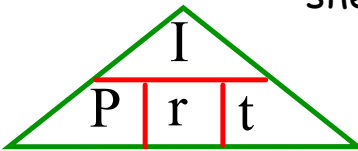
$$r = \frac{I}{Pt}$$

$$= \frac{150}{(1200)(5.5)}$$

$$= 0.0227$$

$$r = 2.3\%$$

HOMEWORK...

Worksheet - Simple Interest.doc

Calculating Interest   Mathematics 113

HANDOUTS

Simple Interest

1. Calculate the **simple interest** for the following loans:

	Principal	Rate/a	Time	Interest
a)	$500	9%	90 d	
b)	$1000	8.5%	150 d	
c)	$2000	11%	10 months	
d)	$2500	9.25%	1 a	
e)	$5000	13.5%	2 a	
f)	$10000	$12\frac{1}{2}$ %	3.5 a	

2. Calculate the simple interest **and** amount of the following loans:

	Principal	Rate/a	Time	Interest	Amount
a)	$250	13%	60 d		
b)	$600	9%	135 d		
c)	$1000	12.5%	25 weeks		
d)	$1350	14%	10 months		
e)	$10000	11.5%	3 a		
f)	$25000	$10\frac{1}{4}$ %	5.5 a		

3. Determine the missing values:

	Interest	Principal	Rate/a	Time
a)	$100	$1000	10%	
b)	$55	$650	5%	
c)	$10.50	$450	2.5%	
d)	$200	$4000		6 months
e)	$500	$10000		2 a
f)	$10		6%	90 d
g)	$150		8%	10 months
h)	$25.50		4.5%	2.5 a
i)		$950	4%	300 d
j)		$5500	6.5%	30 months

Attachments

Assignment - Simple Interest.doc