

Worksheet 6-1: Simple Interest

What is interest?

From the **lender's** viewpoint, interest is the amount **earned** on an investment or savings alternative. From the **borrower's** viewpoint, interest is the **cost** of borrowing money.

Interest is the sum of money a person has to pay for using someone else's money.

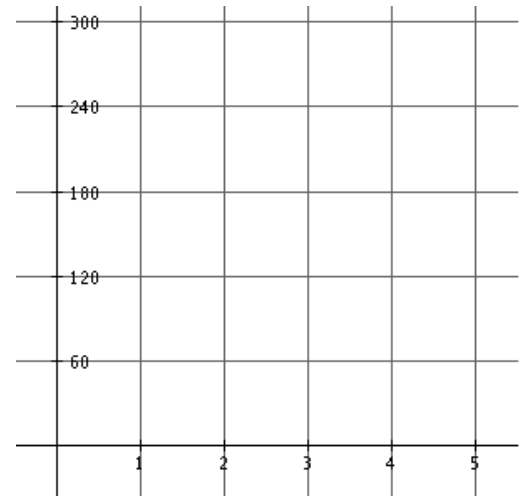
Simple Interest Investigation:

When Rachel was born, her grandparents deposited \$1000 in an account that earns 6% interest each year for 5 years. Every year on Rachel's birthday, her grandparents send her a cheque for the amount of the interest earned.

Year (t)	Amount in Account (P)	Interest Rate (r) per year	Interest Earned per year	Total Interest (I)
1	\$1000	6% = 0.06	$1000 \times 0.06 = \$60$	\$60
2	\$1000	6% = 0.06	$1000 \times 0.06 = \$60$	\$120
3		6% = 0.06		
4		6% = 0.06		
5		6% = 0.06		

(a) What pattern do you see in the table? **Explain the patterns.**

(b) Plot Total Interest against Year.
Describe how the total interest grows.



Simple Interest

- Simple Interest is often earned on **short-term investment** of 1 year or less.
- Time in months or days must be written as a **fraction of 1 year**.
- Some long-term investments also earn simple interest.
- Each year, the interest earned is paid out to the investor.
- As a result, the principal each year is constant.
- So, the interest earned each year is constant as well.

Interest (I), the total interest to be earned or paid, depends on 3 factors:

- (1) **Principal (P)**: the original sum of money invested or borrowed
- (2) **Rate (r)**: the interest rate, **as a decimal**
- (3) **Time (t)**: the length of time invested or borrowed

The Formula for Simple Interest:

$$I = Prt$$

where *I* is the total interest
P is the principal
r is the interest rate (as a decimal)
t is the length of time

Unless otherwise specified, the simple interest rate is annual, or yearly, and the time is in years.

The amount of an investment or loan, (A), is the principal plus the interest:

$$A = P + I$$

The Simple Interest Formula $I = Prt$ can be rearranged to solve for each factor (i.e. *P*, *r* or *t*)

To determine interest rate, *r*:

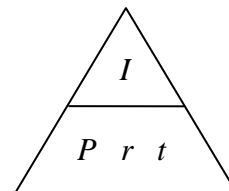
$$r =$$

To determine principal, *P*:

$$P =$$

To determine time, *t*:

$$t =$$



#1: Determine Interest and Amount of an Investment when t is greater than 1 year.

Tamara deposits \$800 in a Guaranteed Investment Certificate (GIC). The GIC earns 5% simple interest each year for 5 years.

(a) What is the total interest earned in 5 years?

$$I = \quad P = \quad r = \quad t =$$

(b) What amount will Tamara receive when the GIC investment matures?

#2: Determine Interest and Amount of an Investment when t is less than 1 year.

Ahmed invests \$10 000 for 5 months in an account that earns 3.4% simple interest per year.

(a) How much interest will he earn altogether?

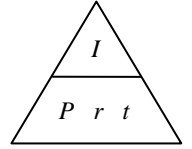
$$I = \quad P = \quad r = \quad t =$$

(b) What amount will Ahmed receive when the investment matures?

#3: Determine Interest Rate

Karen invested \$4000 for 55 months and earned \$1200 in simple interest. What was the annual interest rate on her investment?

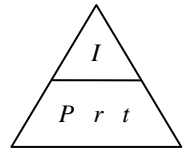
$I =$ _____ $P =$ _____ $r =$ _____ $t =$ _____



#4: Determine Principal

How much must Rahim invest at an annual simple interest rate of 8% in order to earn \$200 in interest over 260 days?

$I =$ _____ $P =$ _____ $r =$ _____ $t =$ _____



#5: Determine Time

Ramona lent \$400 to Shanice at an annual simple interest rate of 12%. Shanice repaid a total of \$664 to Ramona. For how long did Shanice owe Ramona the money?

$I =$ _____ $P =$ _____ $r =$ _____ $t =$ _____

