7.1 Simple Interest

Simple Interest Formula:

$$\boxed{I = \text{Pr}t}$$

I- interest earned, in dollars
P- principal, original amount invested or borrowed, in dollars
r- annual interest rate, expressed as a decimal
t- time in years
A-final amount of the investment or loan, in dollars

$$A = P + I$$

substitute I = Prt

$$A = P + I$$

$$A = P + \text{Pr}t$$ factor P

$$A = P(1 + rt)$$

So Simple Inerest Amount Formula is:

$$\boxed{A = P + I} \quad \text{OR} \quad \boxed{A = P(1 + rt)}$$

use to find ONLY amount at end

Looking at time:

1 year= 1 year

7 months = $\frac{7}{12}$ years

19 weeks = $\frac{19}{52}$ years

251 days = $\frac{251}{365}$ years

# of months in year

365 x 24

Ex 1:

Lisa invested $8000 at 9.25% for 30 months. Calculate the interest earned and the(final) amount.

$P = \$8000$

$r = 0.0925$

$t = \frac{30}{12} = 2.5$

$I = Prt$

$= 8000(0.0925)(2.5)$

$I = \$1850$

$A = P + I$

$= 8000 + 1850$

$A = \$9850$

Ex 2:

Dylan has an investment that earns him $300 each year. If the annual rate is 8%, what is the principal?

$P = ?$

$I = \$300$

$t = 1$

$r = 0.08$

$I = Prt$

$\frac{300}{0.08} = \frac{P(0.08)(1)}{0.08}$

$P = \$3750.00$

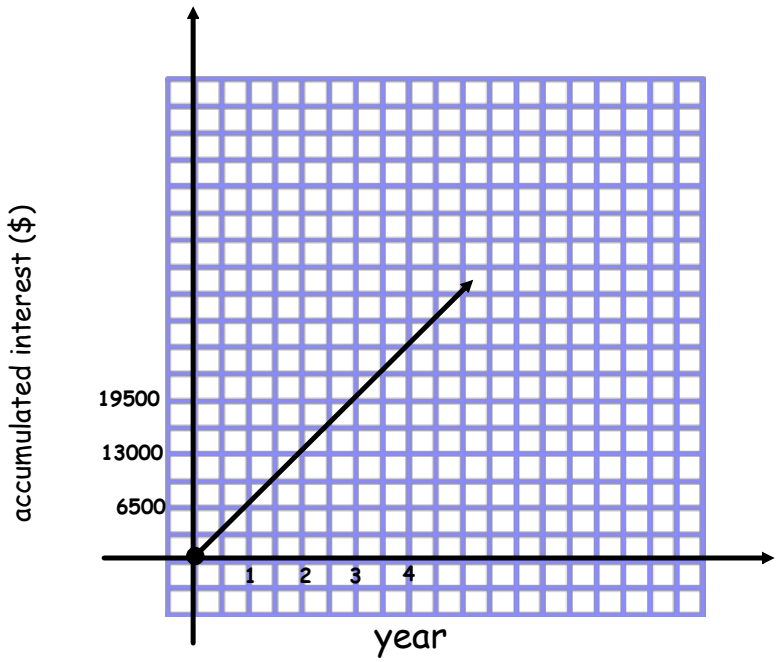
Ex 3:
Complete the table if $100000 is invested at 6.5% /a simple interest.

per annum/year

Note:
You only earn interest on Original amt invested

Year	Interest $ I = Prt	Accumulated Interest $	Amount at end of year
1	$6500	$6500	$106500
2	$6500	$13000	$113000
3	$6500	$19500	$119500
4	$6500	$26000	$126000
5	$6500	$32500	$132500
6	$6500	$39000	$139000

Graph:



Notice Simple Interest is Linear

David invested in a 15-week term deposit that earned ~~7~~ 3/4% ~~of~~ simple interest annually. When it matured he received $1250 in interest. He then reinvested all his money in a 40-week term deposit so that it would earn 8.5% annually.

a) How much was the original ~~investment?~~

$P = ?$
$I = 1250$
$r = 0.0775$
$t = \frac{15}{52}$

$I = Prt$

$\frac{1250}{0.0775\left(\frac{15}{52}\right)} = \frac{P(0.0775)\left(\frac{15}{52}\right)}{(0.0775)\left(\frac{15}{52}\right)}$

$P = \$55\,913.98$

b) How much will David have when the second term deposit mature?

$I =$
$P = 55\,913.98 + 1250 = 57\,163.98$
$r = 0.085$
$t = \frac{40}{52}$

$I = Prt$
$= 57163.98(0.085)\left(\frac{40}{52}\right)$
$I = 3737.64$

$A = P + I$
$= 57\,163.98 + 3737.64$
$A = \$60\,901.62$

PRACTICE:
p459 # 1, 2,4,
5 (simple chart only),
6 - 9, 10a, 13, 15