

## WALT calculate simple interest

### Success Criteria I can

- Solve single step equations
- Change the subject
- Convert percentages to decimals

[Key Skills to calculate simple interest](#)

## Simple interest

When you invest money in a financial institution, such as a bank, the bank pays for the use of your money. This payment by the bank is called **interest** and is calculated as a percentage of the amount invested. Similarly, when you borrow money a charge is made for the use of the bank's money. This charge also is called **interest** and it is calculated as a percentage of the amount borrowed.

If the interest is calculated as a fixed percentage of the original amount invested (or borrowed), it is called **simple interest**.

### ● EXAMPLE 1

Calculate the simple interest received when \$8000 is invested for 3 years at 4.5% p.a.

Solve	Think	Apply
Interest for 1 year = 4.5% of \$8000 = $0.045 \times \$8000$ = \$360 Interest for 3 years = $\$360 \times 3$ = \$1080	Find the simple interest of 4.5% on \$8000 for 1 year and multiply it by 3 to find the interest over 3 years.	Interest = $\frac{\text{rate (p.a.)}}{100} \times \text{amount invested}$ $\times$ number of years

If \$ $P$  is invested for  $T$  years at  $r\%$  p.a., the simple interest,  $I$ , can be found using the formula:

$$I = PRT$$

where  $P$  is called the **principal**,  $R$  is the **interest rate** p.a. expressed as a decimal ( $R = \frac{r}{100}$ ) and  $T$  is the time in years.

## EXAMPLE 2

Use the simple interest formula to calculate the simple interest earned on an investment of \$10 800 at 3.9% p.a. for 5 years.

Solve	Think	Apply
$I = PRT$ $= \$10\,800 \times 0.039 \times 5$ $= \$2106$	Use the simple interest formula $I = PRT$ where $P$ is \$10 800, $r$ is 3.9% so $R$ is $\frac{3.9}{100} = 0.039$ and $T$ is 5 years.	Substitute the values into the formula $I = PRT$ , remembering that $R$ is always a decimal not a percentage.

- 1 Calculate the simple interest received when \$7000 is invested for 2 years at 5% p.a.
- 2 Calculate the simple interest paid when \$12 000 is borrowed for 4 years at 3% p.a.
- 3 Complete the following table.

Principal	Annual interest rate	Time invested (years)	Simple interest
\$5 800	7%	4	
\$15 000	3.5%	3	
\$24 000	4.5%	5	
\$6500	5%	6	
\$18 000	2.8%	2	
\$9 300	3.4%	4	
\$6 000	3%	3	

## EXAMPLE 3

Calculate the amount to which \$7000 will grow in 3 years if invested at 6.5% p.a. simple interest.

Solve	Think	Apply
$\text{Interest} = \$7000 \times 0.065 \times 3$ $= \$1365$ $\text{Amount after 3 years} = \$7000 + \$1365$ $= \$8365$	Use the simple interest formula $I = PRT$ to calculate the interest over 3 years. Add the principal (\$7000) to the interest to find the total amount.	Convert the percentage interest rate to a decimal by dividing by 100.

- 4 Calculate the amount to which \$9000 will grow in 3 years if invested at 6.5% p.a. simple interest.
- 5 Calculate the amount to which \$20 000 will grow in 5 years if invested at 4% p.a. simple interest.
- 6 If I invest \$13 500 at 7.4% p.a. simple interest, how much will I have in 4 years time?

### ● EXAMPLE 4

Calculate the simple interest earned on \$6000 at 8% p.a. for 16 months.

Solve	Think	Apply
$\text{Interest} = \$6000 \times 0.08 \times \frac{16}{12}$ $= \$640$	Number of years the money is invested = $\frac{16}{12}$	Convert months to years by dividing by 12.

**7** Calculate the simple interest earned on each of these investments.

- |  |   |
|--|---|
| <b>a</b> \$5000 at 9% p.a. for 18 months     | <b>b</b> \$7000 at 8% p.a. for 15 months  |
| <b>c</b> \$12 500 at 10% p.a. for 9 months   | <b>d</b> \$3800 at 12% p.a. for 27 months |
| <b>e</b> \$24 000 at 7.8% p.a. for 45 months | <b>f</b> \$8600 at 9.6% p.a. for 6 months |

### ● EXAMPLE 5

Rene invested \$4700 at 6% p.a. simple interest. How long did it take to earn \$1128 in interest?

Solve	Think	Apply
$\text{Interest for 1 year} = 0.06 \times \$4700 = \$282$ $\text{Number of years invested} = \frac{\$1128}{\$282} = 4$ Rene invested his money for 4 years.	Find the interest earned for 1 year: \$282. Divide the total interest by \$282 to get 4 years.	Calculate the annual interest. Divide by this amount to obtain the number of years.

- 8** Harry invested \$13 000 at 6% p.a. simple interest. How long would it take to earn \$4680 in interest?
- 9** Joy invested \$2800 at 3.5% p.a. simple interest. How long would it take to earn \$490 in interest?

### ● EXAMPLE 6

Colin invested \$4000 for 5 years and earned \$700 in interest. What was the annual rate of simple interest?

Solve	Think	Apply
$\text{Interest for 1 year} = \$700 \div 5$ $= \$140$ $\text{Annual interest rate} = \frac{\$140}{\$4000} \times 100\%$ $= 3.5\%$	Divide the interest earned by the number of years. Divide the annual interest by the principal and multiply by 100 to find the interest rate as a percentage.	When calculating interest rates always convert the amount of interest to amount per year.

- 10** Kim invested \$6000 for 5 years and earned \$2100 in interest. What was the annual rate of simple interest?
- 11** Lauren invested \$17 000 for 4 years, earning \$3128 in interest. What was the annual rate of simple interest?

Check Your Answers

**1** \$700

**2** \$1440

**3**

Principal	Simple interest
\$5 800	\$1624
\$15 000	\$1575
\$24 000	\$5400
\$6500	\$1950
\$18 000	\$1008
\$9 300	\$1264.80
\$6 000	\$540

**4** \$10 755

**5** \$24 000

**6** \$17 496

**7 a** \$675

**b** \$700

**c** \$937.50

**d** \$1026

**e** \$7020

**f** \$412.80

**8** 6 years

**9** 5 years

**10** 7% p.a.

**11** 4.6% p.a.