

5.3

Simple and Compound Interest

Focus On . . .

- solving a problem that involves simple interest
- comparing simple and compound interest
- solving a problem that involves compound interest
- estimating the time required for a given investment to double in value

Short-Term GIC

Term/Balance	1000–4999	5000–24999	25000–99999
1–29 days	–	–	0.400
30–59 days	–	0.400	0.500
60–89 days	0.500	0.500	0.500
90–119 days	0.500	0.500	0.550
120–179 days	0.550	0.750	0.750
180–269 days	0.750	0.80	0.800
270–364 days	0.800		

Product Name	Term	Rates for Non-registered and registered (TFSA)
Term Deposit (long-term)	0–29 days	0.00%
	30–364 days	0.05%
	1–2 years less a day	0.05%

simple interest

- interest that is paid once, generally at the end of the time period of the investment
- sometimes called *regular interest*

I

Use the formula $I = P \times r \times t$, where

I is the simple interest

P is the present value

r is the interest rate

t is the length of time the money is invested

↳ Always in years!

future value

- the value of an investment at the end of a certain time period
- also called the *final amount* (A)

$$A = P + I$$

present value

- the amount of money that is invested
- also called *principal*

P

Guaranteed Investment Certificate (GIC)

- an investment that is very low risk because the investment and any interest earned are guaranteed by the bank
- tend to pay higher rates of interest than bank accounts but lower rates than some other investments

term deposit

- an amount of money deposited for a fixed length of time
- there may be penalties for withdrawing the money before the end of the term

On the Job 1

Simple Interest

Ron's business has an amount of cash available for investing. He does not want to tie up the money for a long period of time. He also does not want the money sitting in a bank account earning little interest. Ron takes \$22 000 of the cash and buys a 6-month GIC that will pay simple interest at 1.95%.

one time payment of 1.95% of \$22000.

- What does it mean that the GIC will pay simple interest at 1.95%?
- Interest rates are quoted as a percent per year. Calculate the interest earned.
- Determine the future value of Ron's investment.

b) $I = P \cdot r \cdot t$ ① Change % to a decimal

$I = (22000)(0.0195)(0.5)$ $\frac{1.95}{100} \rightarrow 0.0195$

$I = \$ 214.50$ $\frac{6 \text{ months}}{12 \text{ months}} = 0.5 \text{ yrs.}$

c) $A = P + I$

$= 22000 + 214.50 = \underline{\underline{\$ 22214.50}}$

Your Turn

- a) Use the simple interest formula to determine the interest earned on a \$1000 GIC paying 2.1% interest for 3 years.
- b) Calculate the future value of the GIC 3 years from today.

$$a) I = P \cdot r \cdot t$$

$$I = (1000)(0.021)(3)$$

$$I = \$63.00$$

$$P = \$1000$$

$$r = 2.1\% \rightarrow \frac{2.1}{100} = 0.021$$

$$t = 3$$

$$b) A = P + I$$

$$A = 1000 + 63$$

$$= \underline{\underline{\$1063.00}}$$

An investment earns interest at a simple interest rate of 1.10% per annum. If you invest \$4800.00, how much interest will you earn in 3 years?

$$I = P \cdot r \cdot t$$

$$P = 4800$$

$$r = 1.10\% \rightarrow 0.011$$

$$t = 3$$

$$I = (4800)(0.011)(3)$$

$$I = \underline{\$158.40}$$

You lend \$4000 to a friend, who pays you a simple rate of 3.20% interest.

a) If your friend pays you back after 5 months, how much interest will you earn?

$$P = 4000 \quad t = \frac{5 \text{ months}}{12 \text{ months}} \quad I = P \cdot r \cdot t$$
$$r = 3.20\% \quad I = (4000)(0.032)(0.4167)$$
$$0.032 \quad t = 0.4167 \text{ yrs.} \quad I = \$53.34$$

b) If your friend pays you back in 54 weeks, how much interest will you earn?

$$P = 4000 \quad t = \frac{54 \text{ weeks}}{52 \text{ weeks}} = 1.0385$$
$$r = 0.032 \quad I = (4000)(0.032)(1.0385)$$
$$I = \$132.93$$

c) How long would it take for the debt to double?

homework:

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Comp Check

Wednesday Jan. 13th

→ Budgets

→ Simple Interest