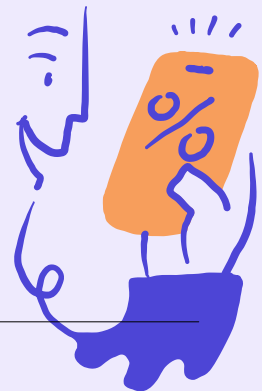# sorted
in schools

Money
matters

Financial mathematics

Getting set up

Are you ready to put your maths skills to work and see how they apply in real-world money situations?

This workbook shows how maths can help you make smart choices—whether you're shopping, travelling, or managing interest.

Let's get calculating!

What am I learning?

By the end of this workbook a whole lot of learning will have happened, but what exactly?

At the end of your mahi you should be able to:

DEFINE and give real life examples of:	CALCULATE	CONVERT	FIND
• Proportions of costs. • Currency conversion. • Compound interest.	• Compound interest on dollar amounts.	• New Zealand dollars into other currencies, and vice versa.	• Proportions of costs.

What's in this booklet?

📖 The learning

In this section I'm learning about -

Proportions of costs

(e.g., the price of 400g of an item, given the cost per kilogram)

By the end of this, I need to be able to:

Give an example of a time when you would need to find proportions of costs.

Find proportions of costs.

Why am I learning this?

It's useful to know how to work out proportions of costs because it helps compare prices and make smart choices when shopping. You can figure out if you are getting a good deal based on the price and weight of the product you are buying. This skill is useful for budgeting, avoiding overspending, and understanding value for money in everyday life.

![Lightbulb icon] # What I need to know

Proportions of costs means comparing costs based on size or amount.

Example 1: Finding proportions of cost based on weight

→ Step 1: Understand the problem

You know the cost of **1 kg.**

You need to find the cost of a smaller amount (**250 g**).

→ Step 2: Find the proportion

250 g is **¼ of 1 kg** (because 1000 g/250 g = 4).

1 kg costs $4, so the cost for 250 g will be **1/4 of $4**.

→ Step 3: Calculate $4 × 0.25 = **$1**

Answer

If 1 kg costs $4, then 250 g (¼ of a kg) should cost $1. ✓

Key words:

cost, ratio, proportion

Example 2: Finding the cost of 1 kg

→ Step 1: Understand the problem

Ask: If I know the cost of 1 kg, can I calculate the cost of less or more than 1 kg?

→ Step 2: Find the proportion

Write down the weight you know (e.g., 250 g or 2 kg).

Convert it to grams if needed (1 kg = 1000 g).

Work out how many times your amount fits into 1 kg:

- If you have 250 g, then 1 kg is 1000 ÷ 250 = 4 times bigger.
- If you have 2 kg, then 1 kg is half of that amount.

→ Step 3: Use the proportion to calculate

If 1 kg is bigger, multiply the cost by the proportion.

If 1 kg is smaller, divide the cost by the proportion.

Answer:

250 g costs $1.20 → 1 kg = $1.20 × 4 = $4.80.

2 kg costs $10 → 1 kg = $10 ÷ 2 = $5.

✏ Giving it a go

Why would you need to find proportions of costs in real life? Why is this a useful skill to have?

Quick calculations

write here ↙

1. If the price per kg is **$30**:	**a.** How much is **500 g**?
	b. How much is **250 g**?
2. If the price per kg is **$18**:	**a.** How much is **100 g**?
	b. How much is **500 g**?
3. If the price per litre is **$3.50**:	**a.** How much is **250 mL**?
	b. How much is **100 mL**?
4. If the price per litre is **$4.20**:	**a.** How much is **500 mL**?
	b. How much is **100 mL**?
5. If 500 ml of milk costs **$1.80**:	How much is **1 litre** of milk?
6. If 250 g of sugar costs **$1.20**:	How much is **1 kg (1000 g)** of sugar?
7. If 100 g of flour costs **$0.40**:	What is the cost of **1 kg (1000 g)** of flour?
8. If 1.5 litres of juice cost **$6**:	What is the cost of **1 litre** of juice?

Comparing shops

1. The supermarket sells almonds at $20 per kg. The dairy sells 500g for $11.

Which shop is cheaper per kg? Show your working.

write here ↙

2. The dairy sells orange juice at $4 per litre. The tuck shop sells 500mL for $2.50. Which shop is cheaper per litre? Show your working

write here ↙

Extension

Choosing electrolytes for sports training

Noah is 14 years old and plays basketball after school. Their coach recommends they stay hydrated and replenish electrolytes after training. Noah visits a supplement store and finds three options:

1. Large container – 500 g for $21

2. Medium packet – 250 g for $12

3. Individual sachets – 100 g each for $6

Noah wants to figure out which option gives them the best value for money.

Your task:

1. Compare the proportions:

- Which option is the most expensive per gram?
- Which option is the cheapest per gram?

2. Discussion questions:

Noah only has $20 to spend. What should they buy to get the most electrolytes for their money? Are there other factors they should consider besides price?

write here ↙

Currency conversion

📖 The learning

In this section I'm learning about -

Currency conversion

By the end of this, I need to be able to:

Give an example of a time when you would need to convert currency.

Convert New Zealand dollars into other currencies, and vice versa.

Why am I learning this?

It's important to understand that money works differently in every country. If you travel, shop online, or compare prices, knowing how to switch between currencies helps you understand what things really cost. It also teaches you about exchange rates, which change all the time, so you can make smart decisions when spending in other currencies.

What I need to know

Currency is the money used in a country. It's what people use to buy and sell things.

Each country usually has its own currency, like New Zealand dollars (NZ$) or euros (€).

Currency conversion is the process of changing one currency into another using an exchange rate.

Exchange rates tell you how much one unit of a currency is worth in another currency. For example, if **$1 NZD** = **$0.60 USD**, then 1 New Zealand dollar equals 60 US cents.

Example: Converting NZ dollars to Australian dollars and back

→ Step 1: Understand the problem
You have **NZ$100** and the exchange rate is:
1 NZD = **0.93 AUD**.
How much is NZ$100 in Australian dollars?
And how much is AU$93 in New Zealand dollars?

→ Step 2: What do you know?
You know the exchange rate: **1 NZD** = **0.93 AUD**.
To go **from NZD to AUD**, you **multiply by 0.93**.
To go **from AUD to NZD**, you **divide by 0.93**.

→ Step 3: Convert NZD to AUD
Amount in NZD = 100.
Multiply by 0.93:
NZ$100 × 0.93 = AU$93

→ Step 4: Convert AUD to NZD
Amount in AUD = $93.
Divide by 0.93:
AU$93 ÷ 0.93 = NZ$100

Answer
NZ$100 = AU$93
AU$93 = NZ$100

Quick tip:
- NZD → AUD = Multiply by rate
- AUD → NZD = Divide by rate

Key words:
currency, convert, exchange rate

✏️ Giving it a go

Converting different currencies

When would you need to use currency conversions in real life? Why is it useful to know how to do this?

Quick conversions

write here ↙

1. Convert NZ$50 to Australian dollars if **1 NZD** = **0.91 AUD**.

2. Convert NZ$200 to euros if **1 NZD** = **0.55 EUR**.

3. Convert NZ$75 to Japanese Yen if **1 NZD** = **90 JPY**.

Reverse conversions

1. Convert €110 to NZD if **1 NZD** = **0.55 EUR**.

2. Convert ¥4500 to NZD if **1 NZD** = **90 JPY**.

Aussie holiday

You are going on holiday to Australia. You have NZ$500 and the exchange rate is $1 NZD = $0.91 AUD.

1. How many Australian dollars do you have?

write here ↙

2. You spend AU$200. How much is that in NZ$?

write here ↙

Visiting grandparents in Fiji

Manisha is 14 years old and is travelling from Auckland to Fiji to visit her grandparents during the school holidays. Manisha has **NZ$300** in spending money for the trip.

Before leaving, Manisha exchanges the money into **Fijian dollars (FJD)** at a currency exchange. The exchange rate is:

- **1 NZD** = **1.35 FJD**

While in Fiji, Manisha wants to buy:

- A traditional handmade necklace for **FJ$45**
- A souvenir rugby ball for **FJ$60**
- Snacks and drinks for **FJ$25**

After the trip, Manisha exchanges the remaining Fijian dollars back into New Zealand dollars. The return exchange rate is:

- **1 FJD** = **0.74 NZD**

Your task:

1. **Convert Manisha's NZ$300 into FJD.**

Use the formula: FJD = NZD x exchange rate.

2. **Calculate the cost of each item in NZD.**

3. **Calculate the total cost of Manisha's purchases in FJD.**

4. **Subtract the total spending from the converted amount to find out how much FJD Manisha has left.**

5. **Convert the remaining FJD back into NZD.**

Discussion question:

Manisha wants to make sure she doesn't run out of money while in Fiji. What are some smart ways she could plan her spending before the trip?

write here

📖 The learning

In this section I'm learning about -

Compound interest

By the end of this, I need to be able to:

Give a definition of compound interest.

Calculate compound interest on dollar amounts, by calculating simple interest month by month for short time periods.

Why am I learning this?

Learning how to calculate compound interest is important because it shows how money can grow over time. Whether it's saving for something big, understanding how loans work, or planning for the future, compound interest teaches us that small amounts can become much larger if you give them time. Knowing this helps you make smarter choices about spending, saving and investing.

What I need to know

Understanding compound interest

Over long periods of time, compound interest supercharges your savings. The money you're putting away is making money for you, helping you reach your goals faster.

The money you save earns interest, which is what you are paid by the bank for holding your money. If you leave that interest in your account, it also starts earning interest of its own. **Compound interest** is when you earn interest on both the money you've saved and the interest it earns.

> The secret to compound interest is time – the earlier you start, the more your money grows!

Example 1: How compound interest works

If you save $100 at 10% interest:

- After a year you have $110.

- The next year, your $100 earns another $10 – and the first $10 of interest also earns $1 interest of its own. You will have $121.

- After three years you'll have $133.

- After 10 years your $100 has become $259. **That is $159 just from compound interest!**

Watch the video:
https://youtu.be/rlQad4i31Qk

Key words:

invest, earn, interest rate, compound interest

Example 2: Calculating compound interest

→ **Step 1: Understand the problem**

You invest **$100** at a **2.5% monthly interest rate**.

How much do you have **in total after 3 months?**

→ **Step 2: What do you know?**

- Starting amount = $100
- Interest rate = 2.5% per month.
- Time = 3 months.

→ **Step 3: Work out the interest after month 1**

- Interest = 2.5% of $100
- Calculate: $100 × 0.025 = $2.50
- New total = $100 + $2.50 = **$102.50**

→ **Step 4: Work out the interest after month 2**

- Interest = 2.5% of $102.50
- Calculate: $102.50 × 0.025 = $2.56
- New total = $102.50 + $2.56 = **$105.06**

→ **Step 5: Work out the interest after month 3**

- Interest = 2.5% of $105.06
- Calculate: $105.06 × 0.025 = $2.63
- New total = $105.06 + $2.63 = **$107.69**

Answer

After 3 months, your investment grows to **$107.69**.

Giving it a go

Short-term interest calculations

In your own words, explain what compound interest means:

write here

Calculate the compound interest earned for the time periods below. Show your working.

write here

1. $150 at 2% per month for 4 months.

2. $200 at 3.5% per month for 6 months.

3. $75 at 1.8% per month for 5 months.

4. $120 at 2.2% per month for 3 months.

5. $300 at 2.5% per month for 12 months.

Exploring interest rates

Investigate savings accounts in New Zealand. Choose an interest rate for 12 months. If you save $500 at the advertised monthly interest rate, how much would you have after 12 months? Show your working.

write here

Example: Starting a band - saving for an amplifier

Kimi is 14 years old and has just started a band with three of her friends. They've been practising in the garage, but the sound isn't loud enough. They've found a great amplifier that costs $400.

To help Kimi learn about saving, her parents have helped her to open a savings account with an initial deposit of $300. The account earns 3% interest per month, compounded monthly. Kimi doesn't add any more money after the initial deposit. They plan to keep the money in the account for 9 months.

Question: How much money will Kimi have after 9 months? Will she have enough to buy the amplifier?

write here

Extension

Compound interest over the long term

Compound interest is best when you save or invest over a long period of time. Watch the video below to discover what a big difference it can make, especially if you start investing when you are young.

Your task:

1. Go to the **Sorted Savings Calculator** and put in the following information:

2. I am growing my money a **bit at a time**

3. I'm putting aside **$10** each week

4. Over **30** years

5. I already have **$100**

6. I am hoping to grow my savings at a rate of **5%**

I am growing my money...

A bit at a time | With a goal in mind

Im putting aside **$10**

Each **Week**

Over **30** | From now **Years**

I already have **$100**

I am hoping to grow my savings at a rate of **5 %**

▶ Watch **this video** to learn more about compound interest

Starting amount	Amount saved every week	Time period in years	Amount of interest earned	Amount you saved	Total savings (interest + savings)
					write here ↙
$100	$10	5			
$100	$10	10			
$100	$10	20			
$100	$10	25			
$100	$10	30			

Wrapping it up

The exchange

A Japanese exchange student named Hana has been living with you for the school year, but it's time for her to go home. She wants to take some New Zealand treats home to her family. She has invited you to come and stay for 2 weeks with her family 18 months from now. That means you have **1 year** to save up for your flights and then another **6 months** to save spending money. You have **$200** in savings already and your parents are going pay **half of the cost of the flights**.

Shopping time

Choose some food items for Hana to take home to share with her family and friends.

write here

1. Go to **www.woolworths.co.nz** to find the prices of the food items Hana would like to buy.

2. Write down the cost per 100 g for these food items. Which is the most expensive per 100 g?

3. Add up the cost of the items to find the total cost.

4. Convert the total cost from NZD to JPY (Japanese Yen).

5. Hana has ¥4000 to spend. Does she have enough? Can she afford to buy more?

Travelling to Japan

You are doing some research to find out how
much it will cost to travel to Japan.

*write
here* ↙

1. Find out how much it will cost
   for a return flight to Tokyo.

2. How much do you need to save?

3. Use the **Sorted Savings Calculator** to plan how you will save for your trip.
   HINT: click on 'with a goal in mind'.

4. How much do you need to save
   per week to reach your goal?

5. How much compound interest
   will you earn over the year?

Spending while you're in Japan

You will need some spending money while you are in Japan. You will eat most meals with Hana's
family. Your spending money needs to pay for local transport, snacks, some activities, shopping
for yourself and gifts for your family.

*write
here* ↙

1. How much money do you think
   you will need in JPY per day?

2. How much will you need in
   NZD for the whole trip?

3. Using the Sorted Savings Calculator
   (link above) work out how much
   you will need to save per week for
   spending while you're in Japan.

Extra bits

Glossary

Earn - Getting money when you do work or get interest from savings.

Exchange rate - how much one unit of a currency is worth in another currency

Compound interest - Compound interest is the amount of interest you earn on both the money you have in your savings, and on the interest you've already earned. In other words, you earn interest on interest. Over time, compound interest makes your money grow like a snowball rolling downhill.

Cost - The amount of money you pay to buy goods or services.

Currency – The money used in each country e.g. dollars, euros, yen.

Currency conversion - the process of changing one currency into another using an exchange rate.

Interest – Interest is the cost of money over time. If you're borrowing, the longer you do the more interest you pay. If you're saving, you're giving your money to a bank to lend, so they pay you interest.

Interest rate – The cost of money over time expressed as a percentage. Money can be more or less expensive to borrow, so rates can be higher or lower.

Invest - This is when you buy something (an asset) that has the potential to increase in value over time and grow your money. Examples include buying shares of a company, property, bonds, or a business.

Ratio - A ratio tells you how much of one thing there is compared to another. It's a way of comparing quantities to understand their relationship.

Proportion – A part as it compares to the whole. This can also be a figure or a share as it compares to the entire amount or value.