

| NSW Department of Education

# Maths trains brains

Explore a mix of fun games,  
useful resources and  
creative activities that you  
can do with your child.



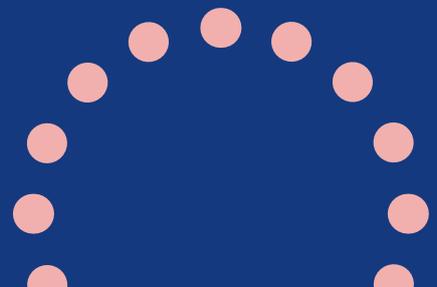
# About this resource

Maths is everywhere! Explore a mix of fun games, useful resources and creative activities that you can do with your child.



**Scan here**

to uncover online maths games and activities for children of all ages



**Time taken:**  
15 Minutes

**Years:**  
7-8, 9-10

**Things you need:**  
Pen and paper

# How to manage your time

High school is a time of new responsibilities - and that includes time management. Work with your child to help them organise their time – you can help them learn how to make sure they can both work and play.

## The challenge

Look at your teen's activities throughout the day and evening, including any homework or assignments they might need to do. Help them plan their time so they can get all their jobs done as well as creating time for them to relax, play, catch up with friends and hang out with family.

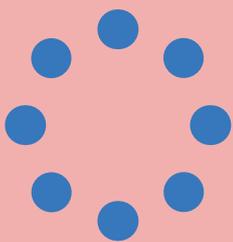
## The career

Time management is an essential skill in any environment. People who have good time management are more effective at achieving their daily tasks. Management, building, transport and logistics and farming are all careers that need a knack for organising time, adapting to changes, and problem solving.

## The conversation

As they are mapping out their time, you could ask them the following:

- "Do you work best in short chunks or long pieces of time? Would you work better if your homework was broken up by other short tasks or fun things? If so, can you design your schedule like that?"
- "Have you allocated enough time to play, relax and spend time with people?"
- "How will you know if your schedule is helping you?"
- "How could we refine your schedule so it works better for you?"



**Time taken:**  
5 to 15 minutes

**Years:**  
3-4, 5-6

**Things you need:**  
Pencil, Paper, A 0-9 dice/ spinner

# Three tens in a row

Three tens in a row is a fun game that's a lot like noughts and crosses. It's even set up just like noughts and crosses with a similar grid.

## How to play

The aim of the game is to write 2 or more numbers in each box that add up to 10. You are trying to get 3 tens in a row either horizontally, vertically or diagonally. The first player to get 3 tens in a row is the winner!

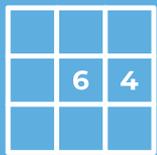
### Step 1

Draw a 3 by 3 grid like a noughts and cross game board



### Step 2

The first player rolls the dice and writes the number in a box of their choice. For instance, they might roll a 4.



### Step 3

The next player rolls the dice. If they roll a 6, they can write their 6 in the same box as the 4 to show that they are combining 6 and 4 to create 10.

### Step 4

Once a box has a sum of 10 any player can use that box to try and make 3 tens in a row.

The players continue taking turns to roll the dice until someone is able to form 3 tens in a row, horizontally, vertically or diagonally.



#### Handy hint!

If you don't have a 9 sided dice you can use a spinner instead. Simply divide a piece of paper into 9 equal triangles. Then put a pencil through a hole in the middle and use a paperclip as the spinner.

**Time taken:**  
10 minutes

**Years:**  
1 to 8

**Things you need:**  
2+ players, 2 dice, Pen and paper

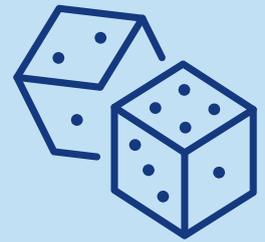
# Pig (dice game)

This fun dice game is a great way to explore probability, and improve your child's confidence with addition. Watch out! This game can lead to some almighty family battles.

## How to play

### Step 1

Set a target number, for example 100. The object of the game is to reach this number. You can choose a larger number so players may play more round.



### Step 2

Players take turns rolling two dice as many times as they want within each round. Players add the amounts rolled, and keep a running total until they decide to stop. When a player decides to stop, they bank their total by recording their score.

But be careful – if you roll a 1, your turn ends and you get zero for that round.

If you roll a double 1 (this is called 'snake eyes'), your turn ends and your entire banked score goes back to zero!

### Step 3

Players take turns swapping rolls after each round, and keeping track of how much they've banked, aiming to be the first person to reach your chosen target number.

## The conversation

This game relies on luck. As you're playing, talk with your child about:

- "Do you think it's certain that I will roll a snake eyes, and lose everything that I've banked?"
- "I really hope you roll a 1. Do you think it's likely?"
- "What are some strategies that you are using to help you keep your running total?"
- "You need 14 more points to get to 100! Can you win in your next go? What would you need to roll? Do you think it's likely that you'll get those numbers?"
- "If we were to play this game again tomorrow, what would you do differently?"

**Time taken:**  
30 minutes

**Years:**  
7-8, 9-10

**Things you need:** 2 people,  
calculator, pen and paper

# Mind reading magic

There are plenty of fun tricks you and your child can work on to amaze your family and friends. Try this one out with your child.



## How to perform trick

### Step 1

Ask your child to think of a number, any number.

### Step 2

Then ask them to double it.

### Step 3

Now add 10.

### Step 4

Halve it.

### Step 5

Take away the original number.

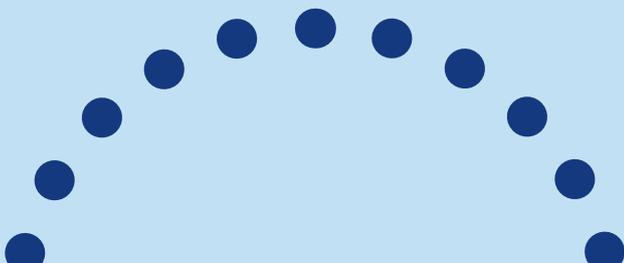
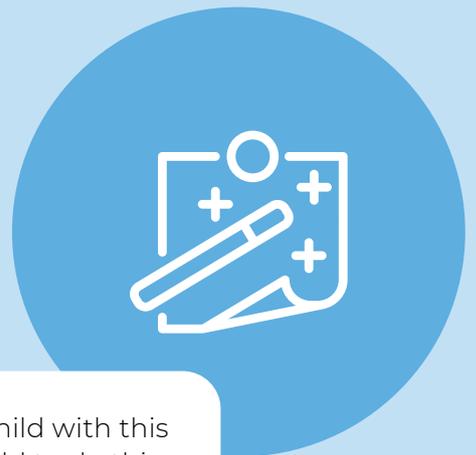
### Step 6

Now tell them that you're going to read their mind using all of your amazing magical powers.

Tell them you know the number that they're now thinking of is... 5!

## The conversation

Many magic tricks are rich in mathematics. After amazing your child with this trick, explore the number magic further by working with your child to do this trick with a few different numbers.



**Time taken:**  
10 minutes

**Years:**  
3-4, 5-6

**Things you need:**  
1 x set of playing cards (Ace-10)

# Go Fish

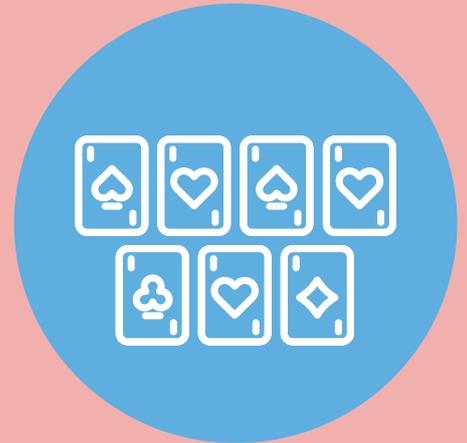
**Go Fish is a fun card game that helps with counting and understanding the relationships between numbers**

## How to play

### Step 1

Shuffle the cards.

Each player gets 7 cards. The rest of the cards are placed in a pile in the middle of the table. This is called the fishing pile.

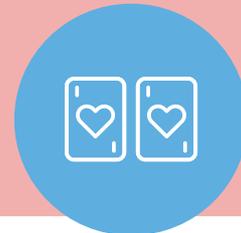


### Step 2

Once a player cannot make any more pairs they ask their opponent for a card that has a number they are seeking. For example they might ask their opponent for 9 if they have an 8.

### Step 3

When the players make their pairs they put them down on the table in front of them.



### Step 4

Once a player cannot make any more pairs they ask their opponent for a card that has a number they are seeking. For example they might ask their opponent for 9 if they have an 8.

Play continues until one player has no more cards left in their hand. They are the winner! A player can also win if they have collected the most number of pairs at the end of the game.

Players can deduce what cards the other player has through their questions. For example, if the other player asks them for a three, then that means they could either be holding a two or a four (one away from three) or else a five or an ace (two away from three).

Play continues until one player has no more cards left in their hand and have only pairs on the table. They are the winner. A player can also win if they have collected the most number of pairs at the end of the game.

**The game helps develop an understanding of mathematical relationships as well as counting forwards and backwards.**

**Time taken:**  
30 minutes

**Years:**  
5 to 10

**Things you need:**  
Rubik's cube

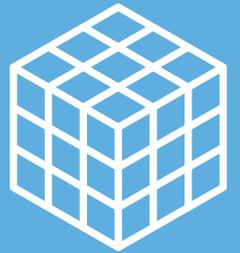
# Rubik's cube

Solving a Rubik's cube is not easy on the first try, but there's actually an algebraic formula to help your child complete the puzzle. Once they've had a red hot go, use Rubik's downloadable solutions guide: [www.rubiks.com/en-us/solve-it](http://www.rubiks.com/en-us/solve-it).

## The challenge

### Part 1

Encourage your child to solve a Rubik's cube without any assistance or understanding of the strategy behind solving it. How did they go?



### Part 2

After they've had a red hot go, use the Rubiks.com downloadable solution guides to explore how algebraic ideas can help you solve the puzzle with your child.

This activity will help your child or teen see just how connected maths is to puzzles and problem solving. In this case, solving the puzzle isn't down to luck and chance - it's maths!



## The conversation

During part 1 of the activity, ask your child what's their strategy for solving the Rubik's cube. Do they have one? Are they trying to solve one coloured face at a time or several at once? Are they noticing any patterns? The main thing is not to worry if they can't solve it, but to get your child thinking about the logic they're using to solve their problems.

During part 2 of the activity, after you've gone through the solution guides and solved the Rubik's cube, ask your child or teen:

- "Are you surprised by the technique you've learned to solve the cube?"
- "Why do you think the approach works?"
- "How hard would it be to solve a Rubik's cube if you didn't have a strategy?"
- "Do you think you could use the same technique to solve another Rubik's cube, like a 3 x 3 cube or a 2 x 2 cube or a 4 x 4 cube?"

## The career

Solving a Rubik's cube takes persistence and patience, but so does any problem worth solving. If your child can nail those two qualities, they'll be well equipped in any career they face, especially mechanics, programming, coding, management and even policy and politics.

# Five games to have fun with maths in Kindy



Games are a fun way to get your child thinking, communicating and reasoning like a mathematician. Here are five games for you to play together.

## Snakes And Ladders

This classic board game can help your child build confidence with quantifying collections, learning how numbers work and developing spatial skills.

Players take turns to roll the dice to determine how many spaces they need to move. Landing on a snake will send you plunging down the board, whereas landing on a ladder will get you closer to the winning square.

If you don't have a commercial copy of the game at home, you can make your own.

## Go Fish

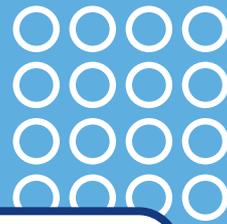
This card game can be played with a standard deck of playing cards.

Go Fish helps your child explore how numbers work as well as developing their skills in quantifying collections and patterning. There's also some strategic thinking required so they can outwit their opponents! You can shake things up by tweaking the rules to explore other mathematical ideas.



## Tiny Polka Dot

You and your child can play different games with this versatile set of colourful cards, aimed at children aged from 3 to 8 years. Playing Tiny Polka Dot can help build your child's understanding of how numbers work, help them quantify collections, and develop reasoning and communicating skills.



## Connect 4

This game is similar to Tic-Tac-Toe or Noughts and Crosses and will help your child practice their skills in quantifying collections, strategic thinking and position.

In Connect 4, two players compete to be the first to make a line of four coloured discs - either vertically, horizontally or diagonally. If you don't have access to the game itself, you and your child can still play a version of it on paper.

## UNO

UNO is a card game that develops your child's knowledge of quantifying collections, how numbers work and strategic thinking. It's played with a coloured deck of cards numbered one to ten, with additional special action cards.

The goal of the game is to run out of cards first, yelling UNO before anyone else when you have one card left in your hand. Coming in classic, junior and specialised formats, UNO is a game the whole family can enjoy!

# Five games to have fun with maths in Years 1-2



These five games are a great way to have fun and help your child develop their ability to think mathematically.

## Blokus

This award-winning game of strategy is an enjoyable way for your child to enhance their spatial reasoning skills and explore area and position.

How do they win? They need to be the player with the most pieces on the board at the end of the game. The players take turns placing coloured tiles on the board. The tiles must have a corner touching another corner of a tile of the same colour, but they cannot be placed edge-to-edge. Good luck reasoning your way into a winning position!

## SET

SET is a card game that uses a specially designed deck with 81 unique cards. The standard game involves laying down no more than 12 cards on a table, with the players finding sets of cards with certain features.

It's a great way to develop skills in patterning and probability, with the odds of finding a set increasing as the game continues.

## Mancala

This ancient game is a great way to help your child work on their problem-solving and reasoning skills as they quantify collections and try to outwit you!

While there are many variations of this game, it usually involves two players and the game ends when one player has captured all of their opponent's pieces.

## Checkers

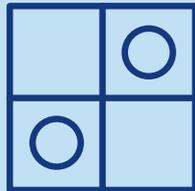
This two-player board game is a classic and helps enhance your child's problem-solving and spatial reasoning skills. As they move across the board, players have to make careful decisions to help them outwit their opponent!

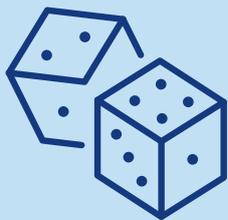
By moving game pieces diagonally and always forward on a checkerboard, your child's goal is to remove all of the other player's pieces from the board or put them in a position where they cannot move. They remove the other player's pieces by "jumping" over them. To win, they'll need to be able to think and plan a few steps ahead!

## Jenga

A game of Jenga will involve you and your child carefully removing blocks out of the tower, and then placing them carefully on top. The person that collapses the tower loses and the game is over.

Jenga by itself is fun enough, but it also supports ideas about 3D objects, mass, equivalence and also basic engineering concepts like balance, load and position.





# Five games to have fun with maths in Years 3-4



Games are a fun way to get your child thinking, communicating and reasoning like a mathematician. Here are five games for you to play together.

## Yahtzee

Yahtzee is a great way for your child to enhance their skills in quantifying collections, understanding how numbers work and using operations. Combining both skills and luck, there's a chance that probability might enter the conversation too!

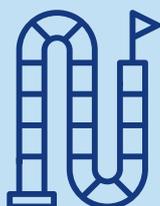
The object of the game is to get the highest score. Players take turns rolling dice and meeting specific criteria to grow their score. Good luck rolling a Yahtzee!

## Finska

This game takes maths outdoors. Players take turns to throw a wooden log - the Finska - at a set of numbered pins. Similar to lawn bowls or bowling, the aim of the game is to score exactly 50 points.

Playing Finska involves working with the operations, quantifying collections and using what we know about how numbers work. It also requires mathematical reasoning, problem solving and spatial awareness to hit your target.

You can use this game to explore velocity and risk because they are also underpinned by maths!



## Chess

A classic game, chess is steeped in opportunities to deepen mathematical skills and understanding. Players take turns moving one chess piece at a time until one player is able to capture their opponent's king.

A great game to develop mathematical reasoning and patient problem solving, chess promotes your child's understanding of concepts such as position, angles and probability.



## The Game Of Life

Does your child wish they were a grown-up already? Here's a chance for them to give adulthood - and some maths - a trial run.

This board game helps our understanding of working with money by exploring ideas like: earning a wage; paying taxes and exploring debt. It also helps understand operations and how numbers work.

## Sequence

Sequence is a game of strategy! Helping your child enrich their understanding of position and probability, the aim of the game is to be the first person to make 2 collections of five tokens in a row. Aside from exploring position and probability, this game is rich in mathematical reasoning.



Having a positive mindset can help improve outcomes and understanding in all aspects of your teen's learning. Packed with profound lessons, inspiration and real-life stories about resilience, problem solving and perspective, these resources can continue to support a positive mindset towards learning and mathematics.

### **Grit: The Power Of Passion And Perseverance**

Developed by TED Talks  
Speaker: Angela Lee Duckworth

Leaving a successful career in consulting, Angela Lee Duckworth took a job teaching maths to Year 7. She quickly realised that IQ wasn't the only thing that mattered in supporting students to experience success with mathematics. In this TED talk, Angela explains her theory of "grit" which might help you talk with your teen about the critical importance of perseverance and resilience when you're learning.

### **Mathematics Is The Sense You Never Knew You Had**

Developed by TED Talks  
Speaker: Eddie Woo

In this engaging and insightful talk for TEDxSydney, mathematics teacher Eddie Woo explores the mathematical realities woven into the fabric of the universe – from lightning bolts to river deltas to blood vessels. Eddie makes the bold statement that we are all born to be mathematicians - let his joy and passion for learning inspire you and your teen to consider mathematics as a whole new way to see the world.



# Five resources to build positive maths mindsets in Years 9-10

### **Richard Turere: My Invention That Made Peace With Lions**

Developed by TED Talks  
Speaker: Richard Turere

In the community where Richard Turere lives with his family, cattle are vital to their way of life, but lion attacks can put an entire family's herd and future at risk. In this TED talk, you'll learn how Richard used maths to invent and design a solar-powered solution that safely scared the lions away and continues to protect his family and their livelihood. Enjoy this story about how maths helped Richard and his community, and illustrate the power of problem solving and grit with your teen.

### **The Joy Of X: A Guided Tour Of Mathematics, From One To Infinity**

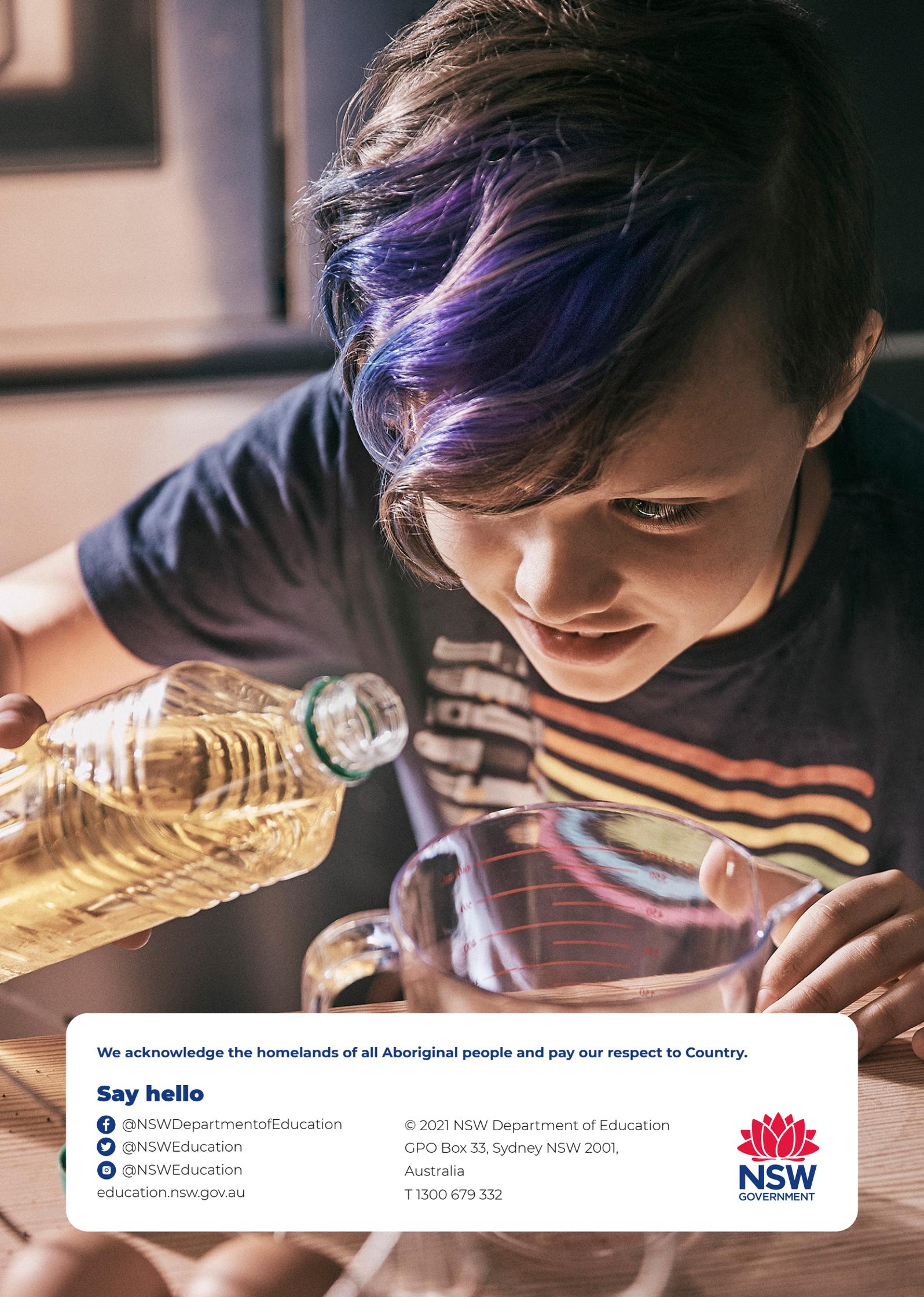
Written by Steven Strogatz

Have you ever wondered why mathematicians love maths? In each chapter of this book, Strogatz explains why maths is helpful, inspiring and lovable, with clarity and humour. This book can help your teen see the links between maths and literature, philosophy, law, medicine, art, business, even pop culture and current events. Now these are some ideas worth knowing!

### **Careers In Maths**

Developed by Australian Mathematical Sciences Institute

We know having a positive mindset can help improve outcomes – let this resource inspire your teen to achieve a long-term mathematical goal. Discover the mathematics from gene mapping to zoo keeping, dancing, nursing and building... whether you're protecting forests, fighting fires or dreaming up robots. The AMSI website has over 25 clips that highlight maths and STEM skills in a variety of career pathways.



We acknowledge the homelands of all Aboriginal people and pay our respect to Country.

### Say hello

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