## THINK

Children use maths every day – when they count, share, play, do sport, make cakes or move to music.

## MATHS IS FUN

This book introduces real-life opportunities to develop mathematical understanding. Younger children can enjoy Tom Lehrer's lyrics and Elīna Brasliņa's joyful illustrations, picking up core maths language along the way. Advanced readers are encouraged to TRY THIS and EXPLORE THIS by Scottish Teacher of the Year Chris Smith to deepen their maths knowledge.

## ALL JOIN IN

There are parents' notes at the back of the book, and supporting activities online that you can download to continue the fun.

"A great way to show that maths is more than just problems in a textbook. It's all around us! A brilliantly fun book."

MICHAEL STEVENS
Creator of Vsauce, YouTube Channel

"In the footsteps of Tom Lehrer, Chris Smith shows that you are never too young to have fun with maths."

JOHNNY BALL
TV presenter and lifelong maths lover

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TOM LEHRER'S THAT'S MATHEMATICS SMITH • BRASLIŅA

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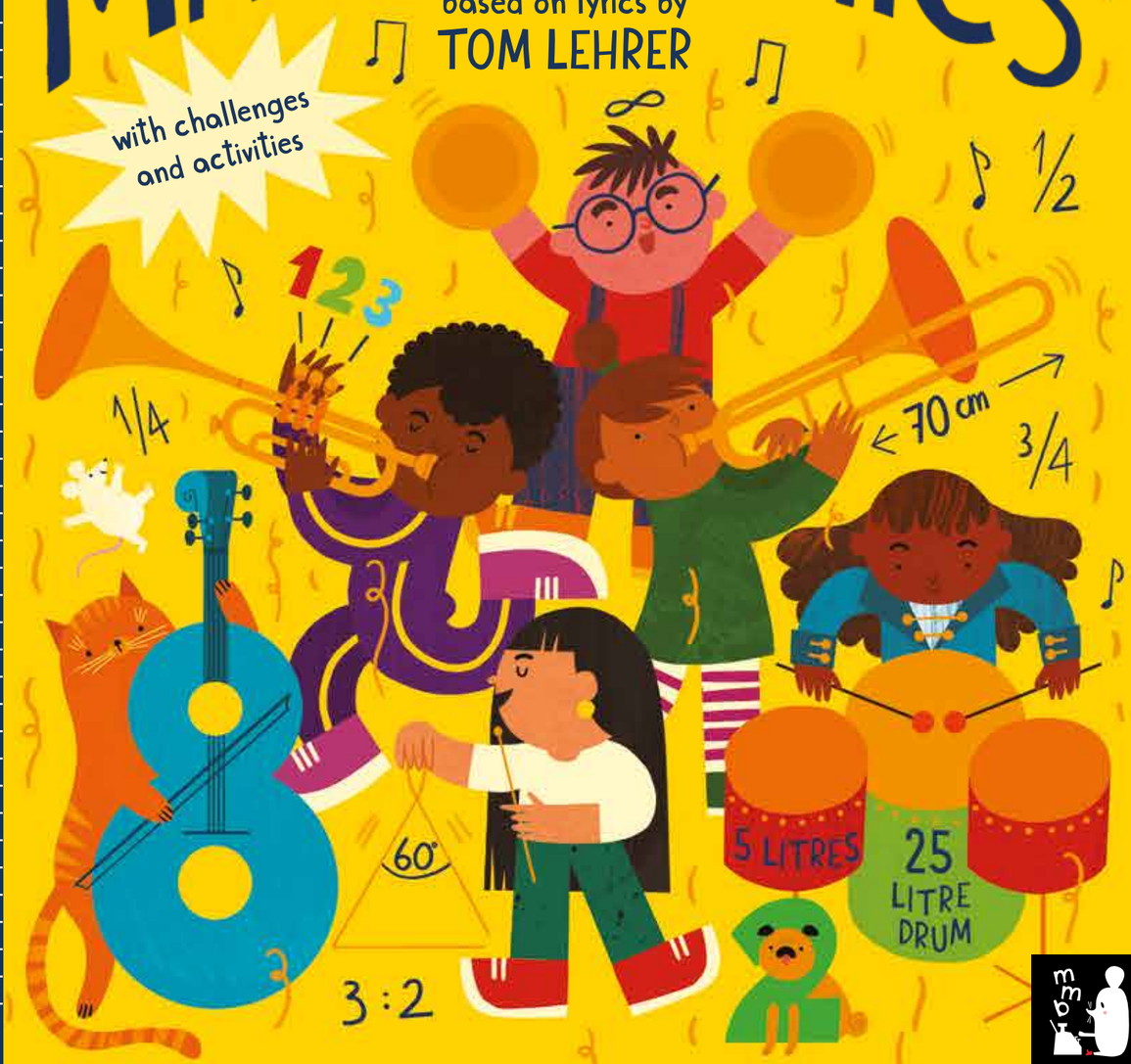
CHRIS SMITH

ELĪNA BRASLIŅA

# THAT'S MATHEMATICS

based on lyrics by TOM LEHRER

with challenges and activities



## ABOUT TOM LEHRER AND THIS SONG

Tom Lehrer is an American singer-songwriter, musician, satirist, mathematician and all-round genius. In 1959, when at Harvard University, he performed his "completely pointless" but utterly breathtaking song *The Elements*, featuring all the elements in the Periodic Table. Daniel Radcliffe (Harry Potter) performed this song on TV in 2020 and called Lehrer the "cleverest and funniest man of the 20th century".

Lehrer wrote around 50 songs, and summed up the connection between maths and music. "The logical mind, the precision, is the same that's involved in math as in lyrics," he said. "It's like a puzzle, to write a song."

In 2020, Lehrer granted permission for anyone to use, perform or publish his lyrics. So, as a maths-loving musician myself, I performed Tom's wonderful *That's Mathematics* song, with a stellar group of enthusiastic mathematicians singing along as I played piano. It might seem weird to sing about maths but everyone in that viral video wanted to belt out the message that maths is all around us, that we use it sometimes without even realising it, and that it's a wonderful, exciting, vibrant, beautiful subject. Our song became the catalyst for this book. I hope that Tom's lyrics, Elina's adorable illustrations and my ideas for kids and parents convince you, when you see something nifty, to announce "That's mathematics!"

*Chris Smith*
Scottish Teacher of the Year, 2018

*See videos of Tom Lehrer and Chris Smith perform* That's Mathematics *on the website www.mamamakesbooks.com*

For supporting activities, scan the QR code, or go to mamamakesbooks.com/thats-mathematics.

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*That's Mathematics* lyrics written by Tom Lehrer
Additional text written by Chris Smith
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Printed in China on FSC paper.

# THAT'S MATHEMATICS

Original words by Tom Lehrer
For sheet music visit tomlehrersongs.com

Counting sheep --- when you're trying to sleep,
Being fair --- when there's something to share,
Being neat --- when you're folding a sheet,
That's mathematics!
When a ball --- bounces off of a wall,
When you cook --- from a recipe book,
When you know --- how much money you owe,
That's mathematics!

How much gold
Can you hold
In an elephant's ear?
When it's noon
On the moon,
Then what time is it here?
If you could count for a year,
Would you get to infinity
Or somewhere in that vicinity?

When you choose --- how much postage to use,
When you know --- what's the chance it will snow,
When you bet --- and you end up in debt,
Oh, try as you may,
You just can't get away
From mathematics!
Tap your feet --- keeping time to the beat
Of a song --- while you're singing along,
Harmonize --- with the rest of the guys,
Yes, try as you may,
You just can't get away
From mathematics!

# COUNTING SHEEP WHEN YOU'RE TRYING TO SLEEP

Counting is probably the first mathematics you ever learned. It's simply our way of numbering things to find out what the total is.

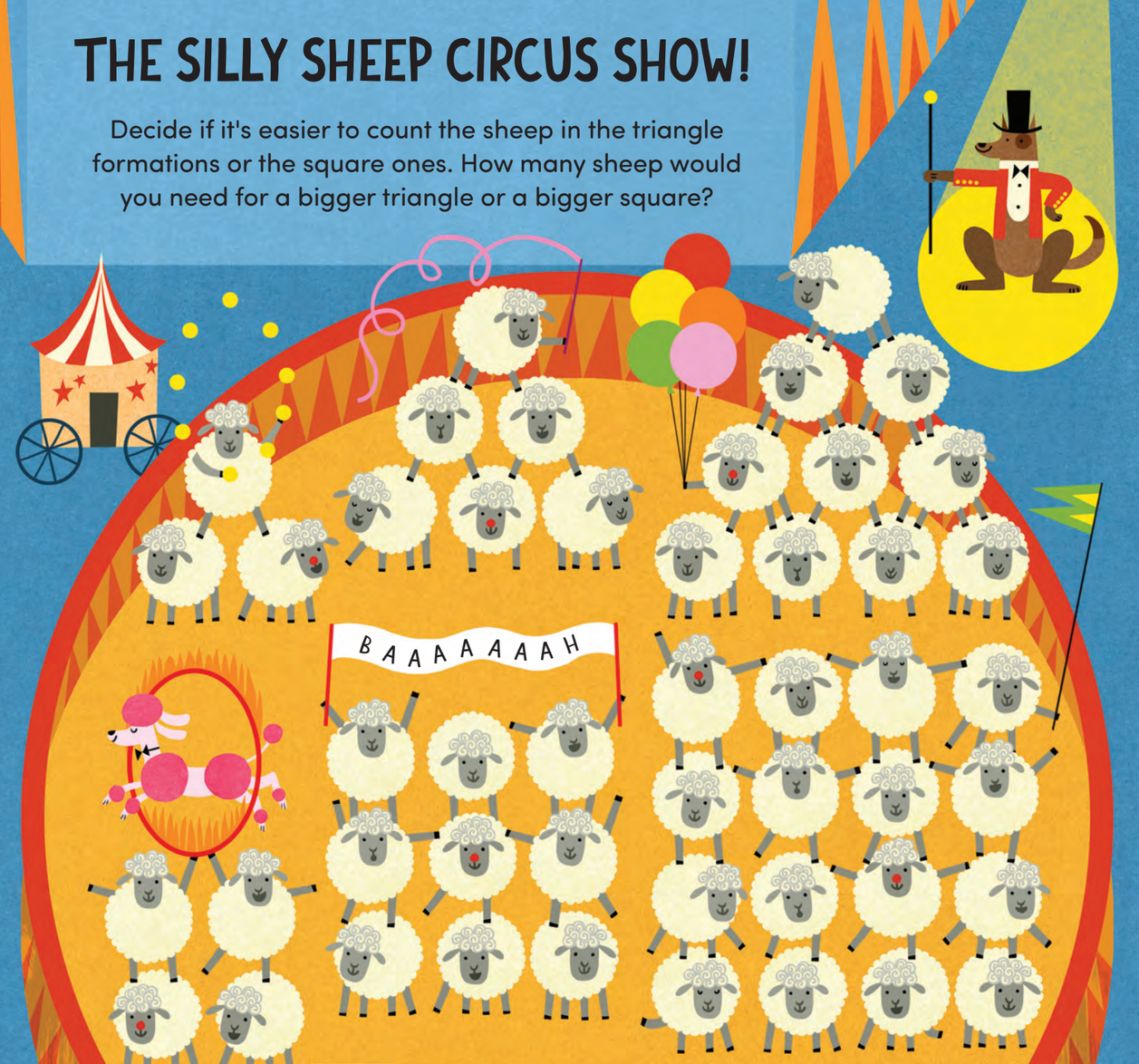
## TRY THIS

Write the numbers 1 to 10 (or 20) on small pieces of paper. Jumble them up. How quickly can you put them in order?

*Online activity sheet available

# THE SILLY SHEEP CIRCUS SHOW!

Decide if it's easier to count the sheep in the triangle formations or the square ones. How many sheep would you need for a bigger triangle or a bigger square?



## EXPLORE THIS

One of the above groups of sheep has fallen down. Count the sheep to find out which one.

# BEING FAIR WHEN THERE'S SOMETHING TO SHARE

In mathematics, sharing means splitting into equal parts. This is called **dividing**. All **even numbers** can be divided by two. So any even group of things – 6 balloons, 8 dog bones or 2 lollipops – can be shared fairly between two people.

## TRY THIS

Look at this bar of chocolate. How many pieces does it have? If three children share it fairly, how many pieces does each one get? What about two, four or six children?

*Online activity sheet available

## EXPLORE THIS

Some numbers, like 12, are nice for sharing, but how about 5 or 7 or 11? Seven bananas can only be shared fairly with seven monkeys. Numbers like this, that can only be divided by themselves or 1, are called **prime numbers**. Can you find any more?

# GLOSSARY

**add** Finding the total of two or more numbers together, represented by a + symbol in calculations.

**angle**

- **acute angle** An angle greater than zero but less than 90 degrees.
- **obtuse angle** An angle greater than 90 degrees but less than 180 degrees.
- **right angle** An angle that is exactly 90 degrees.

**arithmetic** The maths that deals with numbers, including adding, subtracting, multiplication and division.

**capacity** The maximum something can contain until it is full.

**diameter** The straight line that joins one side of a circle to another through its centre.

**dimension** Flat shapes have two dimensions (we say they are 2D). They have a length and a width. Shapes you can hold have three dimensions (these are 3D). They have a length, a width and a height too.

**divide** To split a number or amount by another number, represented by a ÷ symbol.

**estimating** Using what you know to guess an amount or value.

**fraction** Part of a whole.

**geometry** The maths that deals with shapes, angles, surfaces, lines and points.

**infinity** A number greater than any you can imagine.

**length** A measurement from end to end (eg. longest side of a rectangle).

**multiply** When you times or multiply two or more numbers, represented by an x symbol.

**number**

- **even number** A number that can be divided exactly by 2.
- **odd number** A number that can't be divided exactly by 2.
- **prime number** A number that can only be divided by itself and 1 (1 is not considered a prime number).

**number bonds to 10** Pairs of numbers that add together to make 10, such as 9 + 1 and 8 + 2.

**probability** The likelihood of something happening.

**subtract** When you take a number away from another number, respresented by a – symbol.

**symmetry** When you can draw or imagine a line halfway through something and one side of the line is exactly the same as the other side.

**temperature** How hot or cold something is, measured using degrees and represented by a ° symbol.

**vicinity** Near, not far away.

**volume** The amount of space something takes up (eg. the volume of a shape) or the quantity (eg. of a liquid).

**weight** How heavy something is.

**width** A measurement from side to side (e.g. the shortest side of a rectangle).