DEVELOPING
PEDAGOGY IN MATHS

MASTERING
MULTIPLICATION

IDEAS AND INSPIRATION FOR TEACHING TIMES TABLES

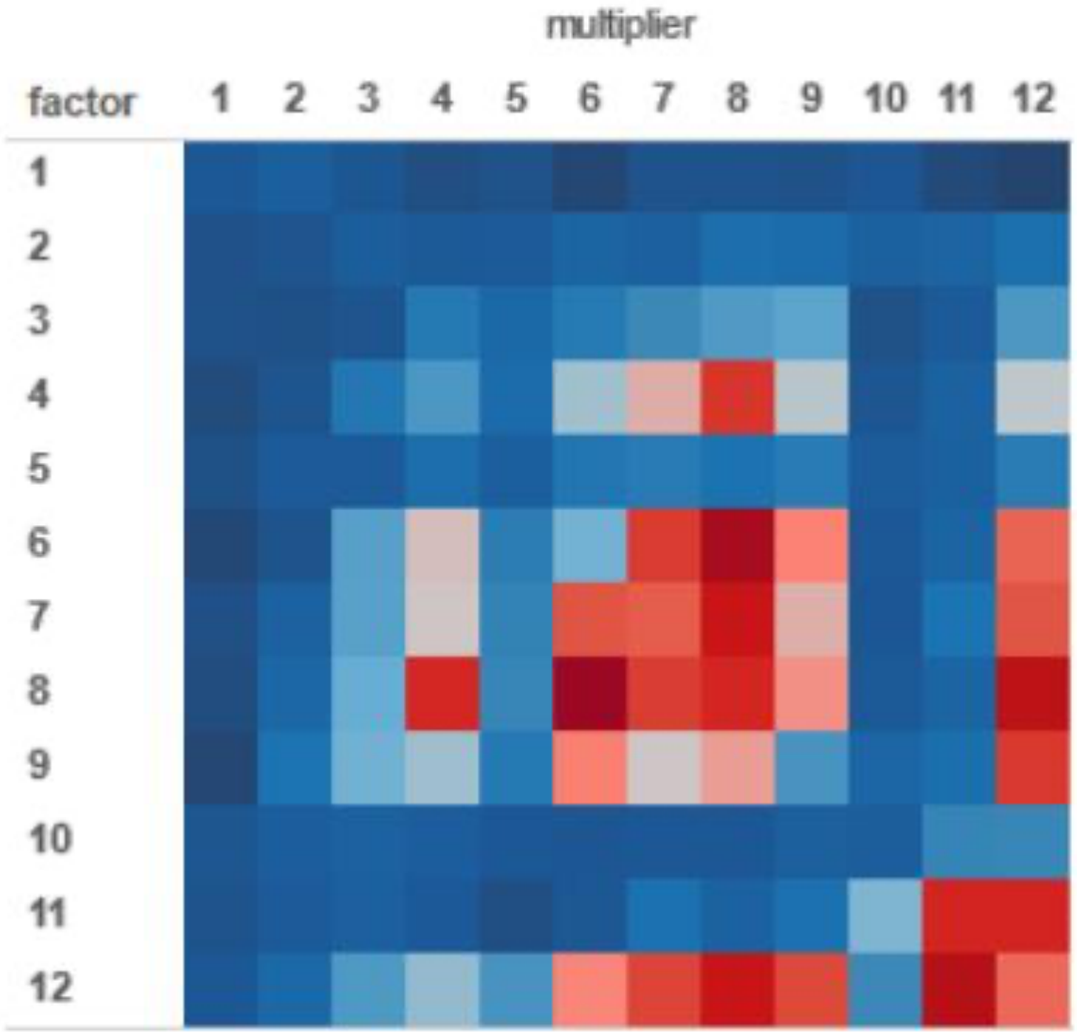
SUPPORTING TEACHERS TO BECOME **MORE EXPERT** IN **TEACHING MATHS**

‘THE’ Way…



The **‘best way’** to teach times tables is a **discussion point** for many teachers!

The Challenging Facts!



The **multiplication** that children got most wrong!

8 x 6

11 x 12

12 x 8

8 x 12

12 x times tables the most difficult - closely followed by **8 x times tables**!

Education Endowment Trust

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….”no **one balance** of activities was **more effective than another**!”

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…."times tables may be best taught by using **a balanced approach** - teaching both the concepts behind them and **practising them** in a range of ways with low-stakes testing!"

Common Approach



It is important for school's to agree a **common and consistent approach** to teaching of tables - highlighting expectations in order to support the children, staff and parents!

A Common Approach

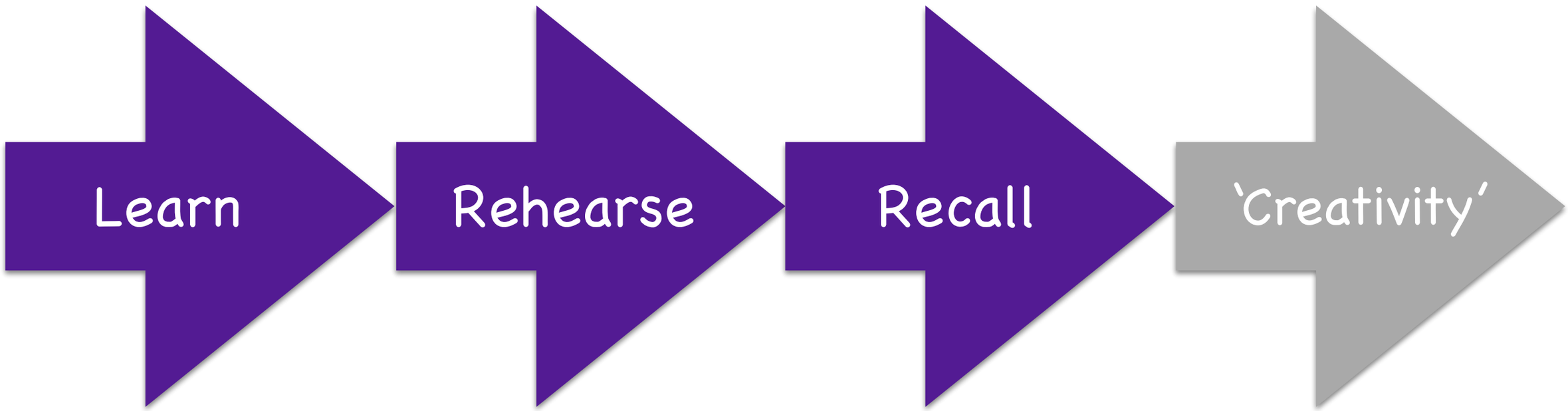
Is this approach the same **across the school** - are the 'end of year' expectations made clear (is there a routeway?)



Whole School Approach

Year	Count	Multiplication Facts
Reception	1s, 2s, 10s	-
Year 1	1s, 2s, 5s, 10s	2x, 10x
Year 2	1s, 2s, 3s, 4s, 5s, 10s	3x, 4x, 5x
Year 3	1s - 6s, 8s, 10s	6x, 8x
Year 4	1s - 12s	7x, 9x, 11, 12x
Year 5	1s - 12s	Squares and Roots
Year 6	1s - 12s	Squares, Cubes and Roots

Thinking Systematically!



Consider Timetable!

Sample Timetable

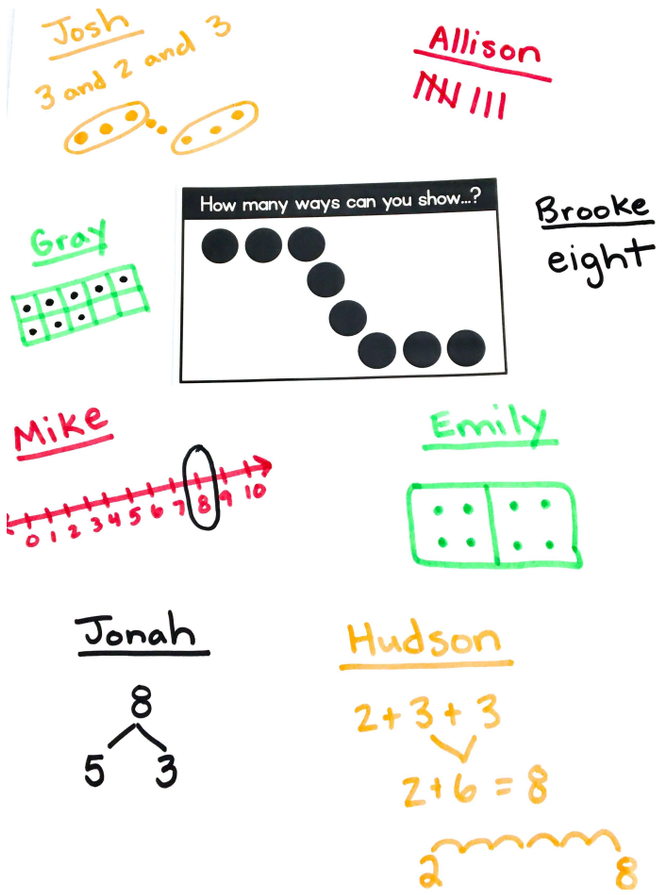
	8:45 9:00		10:00	10:30 10:45		11:45	12:15	1:15 1:30		2:15	3:00	3:30	
Monday		English		Spelling	Break time	Maths		VIPERS	Lunch	PE / ART/DT			Class Reader
Tuesday	Star of the Week Assembly	English			Break time	aths		VIPERS	Lunch	Science			Class Reader
Wednesday	Morning Work	English		Spelling	Break time	aths		VIPERS	Lunch	PE (Hall) / PSHE			KS2 Assembly
Thursday		English		Dictation	Break time	Maths		VIPERS	Lunch	SPANISH	RE		Class Reader
Friday	Morning Work	English		Reading for Pleasure	Break time	M		VIPERS	Lunch	Humanities	MUSIC		Class Reader

Vocabulary

multiply
times
groups of
lots of
repeated addition
product
multiplied by
array

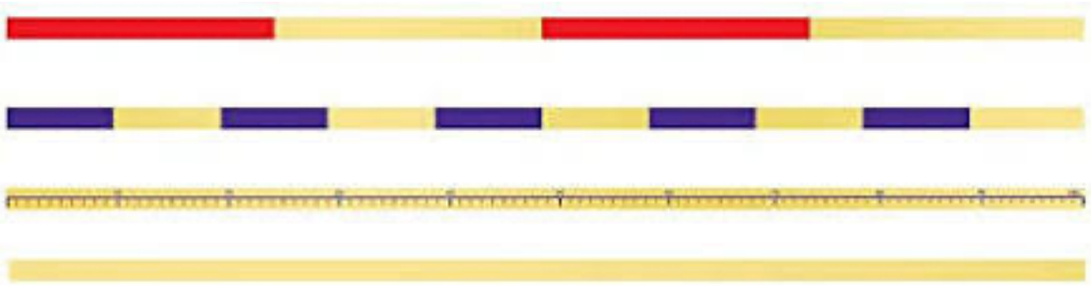
altogether
repeat
multiplicand
multiplier
factor
square (multiplied by itself)
cube
double
treble
quadruple

Number Sense



Number Sense = Number Flexibility

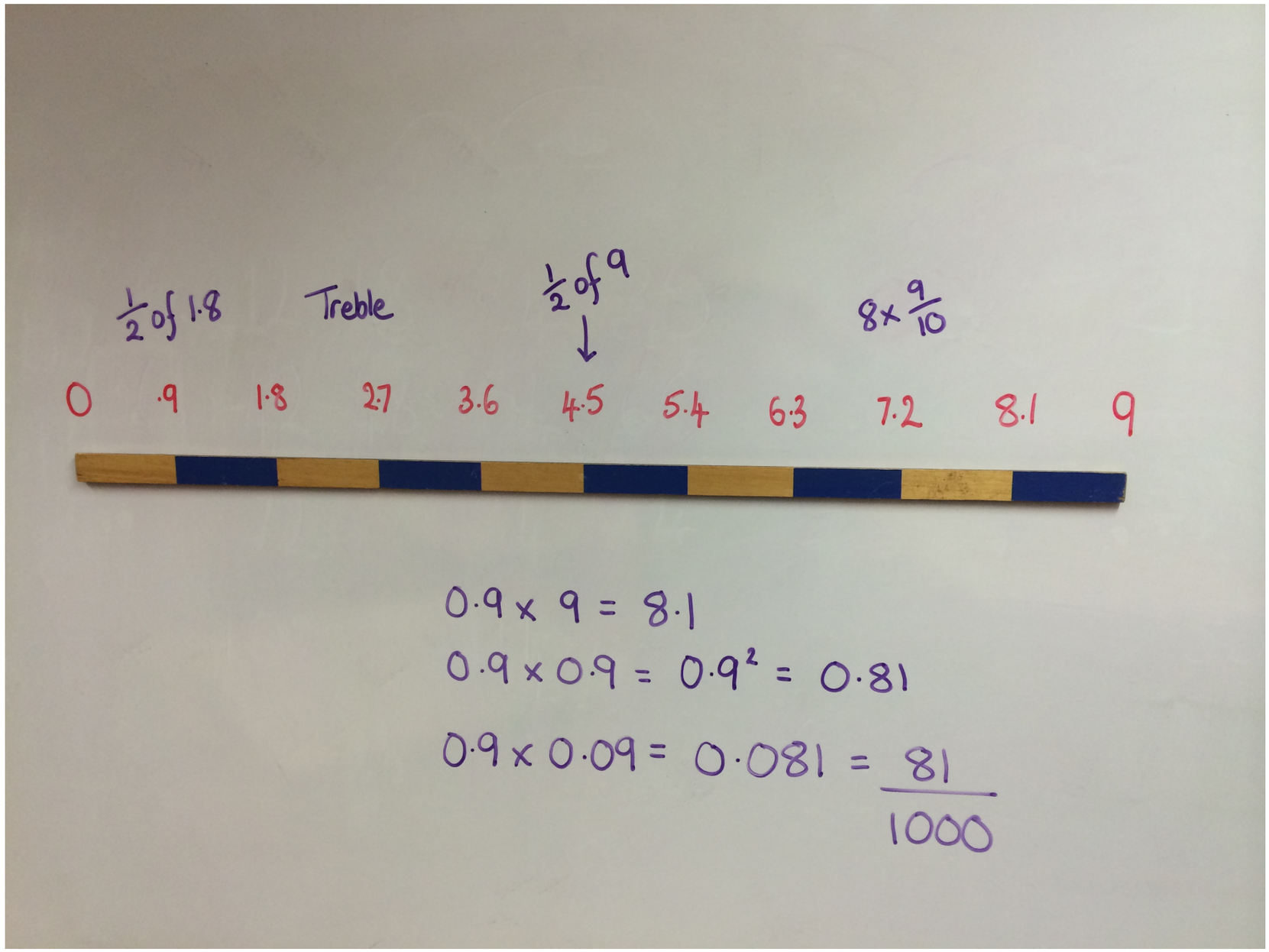
A Counting Stick



A **counting stick** is an essential resource in the classroom

Activities with one require **minimal input** and effort - easy to extend and support groups of children

Times Tables

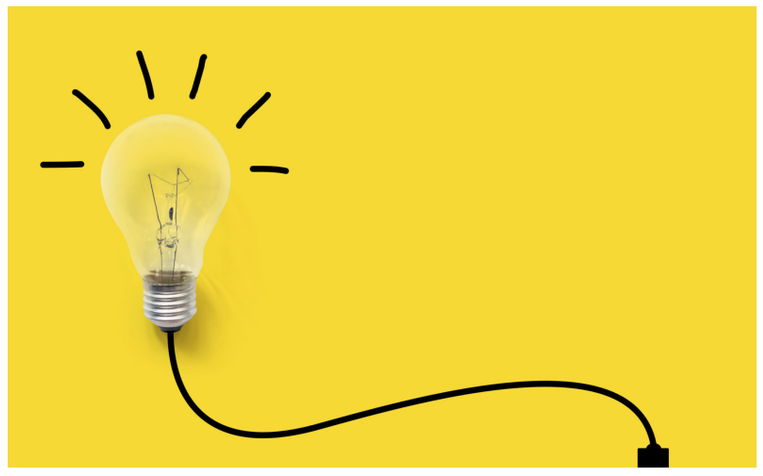


IDEAS AND INSPIRATION FOR TEACHING TIMES TABLES

The Threes!

3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36

Have a **digital root** of 3, 6 or 9



O, E, O, E **pattern**

Multiplying 3 by an **odd number**
results in an **odd number (even results in even!)**

Adding Challenge!

Explore some **3-digit** and **4-digit numbers** that are multiples of 3
e.g. 432, 711 or 1230, 4311

457 is not a multiple of 3 (digital root is not 3, 6 or 9!) So what is the **next multiple of 3** and the following one too!

Investigate **how many multiples of 3** there are between 1 and 100 (33).

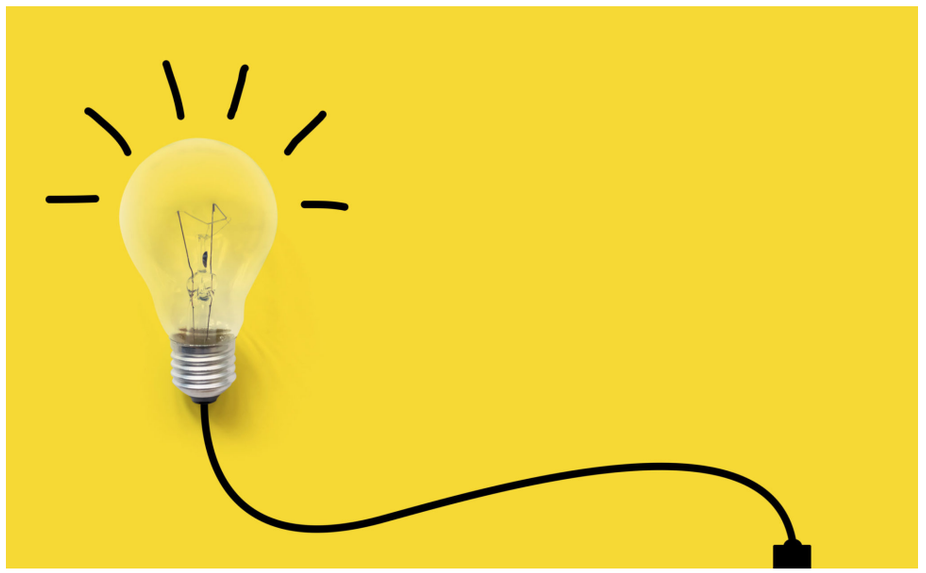
Can you think of an '**even numbered**' '**4-digit number**' that is a multiple of 3?

What is the **smallest** 4-digit number that is a multiple of 3?

The Fours!

4, 8, 12, 16, 20, 24, 28, 32, 26, 40, 44, 48

Multiples are 'always even' and end in 2, 4, 6, 8 or a 0

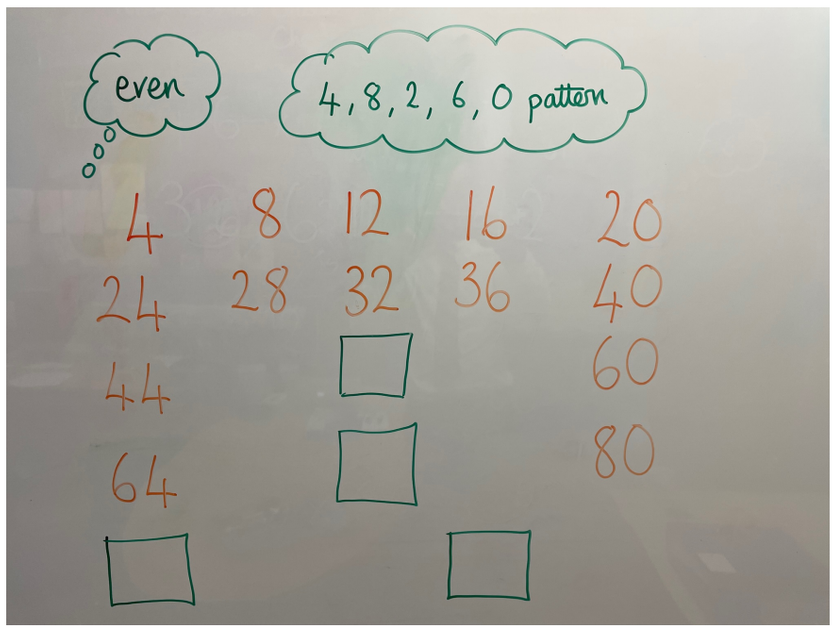


The last two digits must be divisible by 4 e.g 280 (80 is divisible by 4!) and e.g. 322 (22 is not a multiple of 4)

Adding Challenge!

Explore some **3-digit** and **4-digit numbers** that are multiples of 4 (the last 2 digits are multiples of 4 e.g. 464

What is the **smallest** or **largest** 3-digit number that are multiples of 4...extend to **4 and 5 digit numbers**



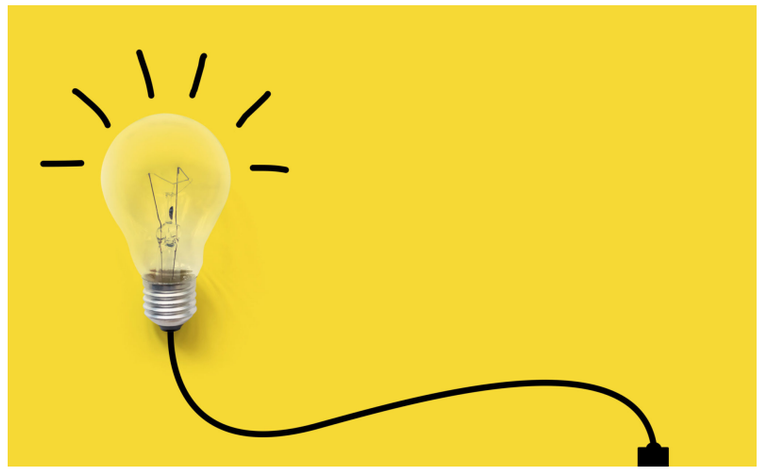
Explore patterns - even numbers that end in 4, 8, 2, 6 or 0!

The Sixes!

6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72

Have a **digital root** of 3, 6 or 9

Multiples are always even!



Adding Challenge!

Move beyond the 12th multiple - investigate even numbers that have a **digital root of 3, 6 or 9** a e.g. 1332

10, 100 and 1000 times bigger or smaller (Resource!)

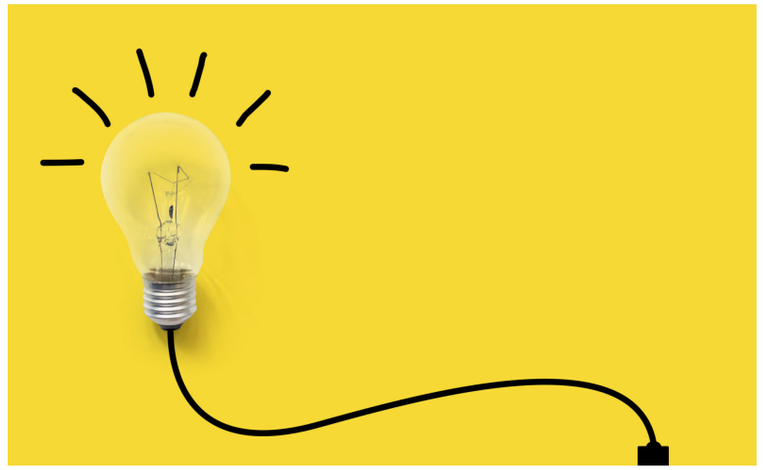


256 **is not a multiple of 6** but what is the closest multiple (252 or 258?) How many more to this number?

The Sevens!

7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84

Odd, Even, Odd, Even pattern



There aren't the same patterns that you find with others so they are a more challenging times table to master!

Adding Challenge!

252

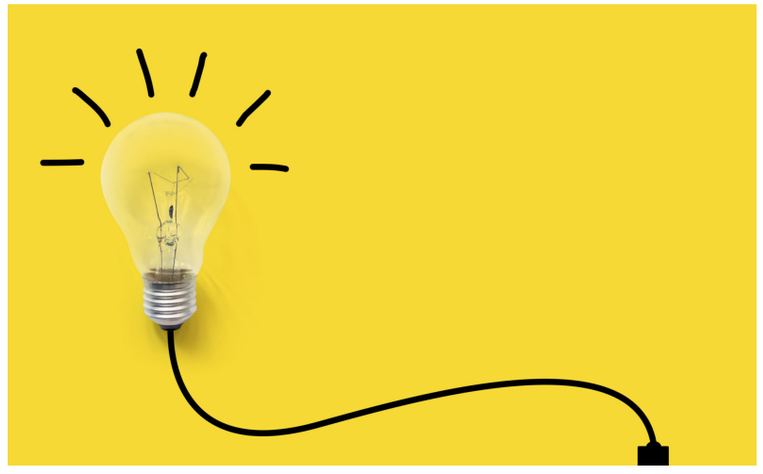
25 - 4 = 21 ✓

21 is divisible by 7 and so is 252

The Eights!

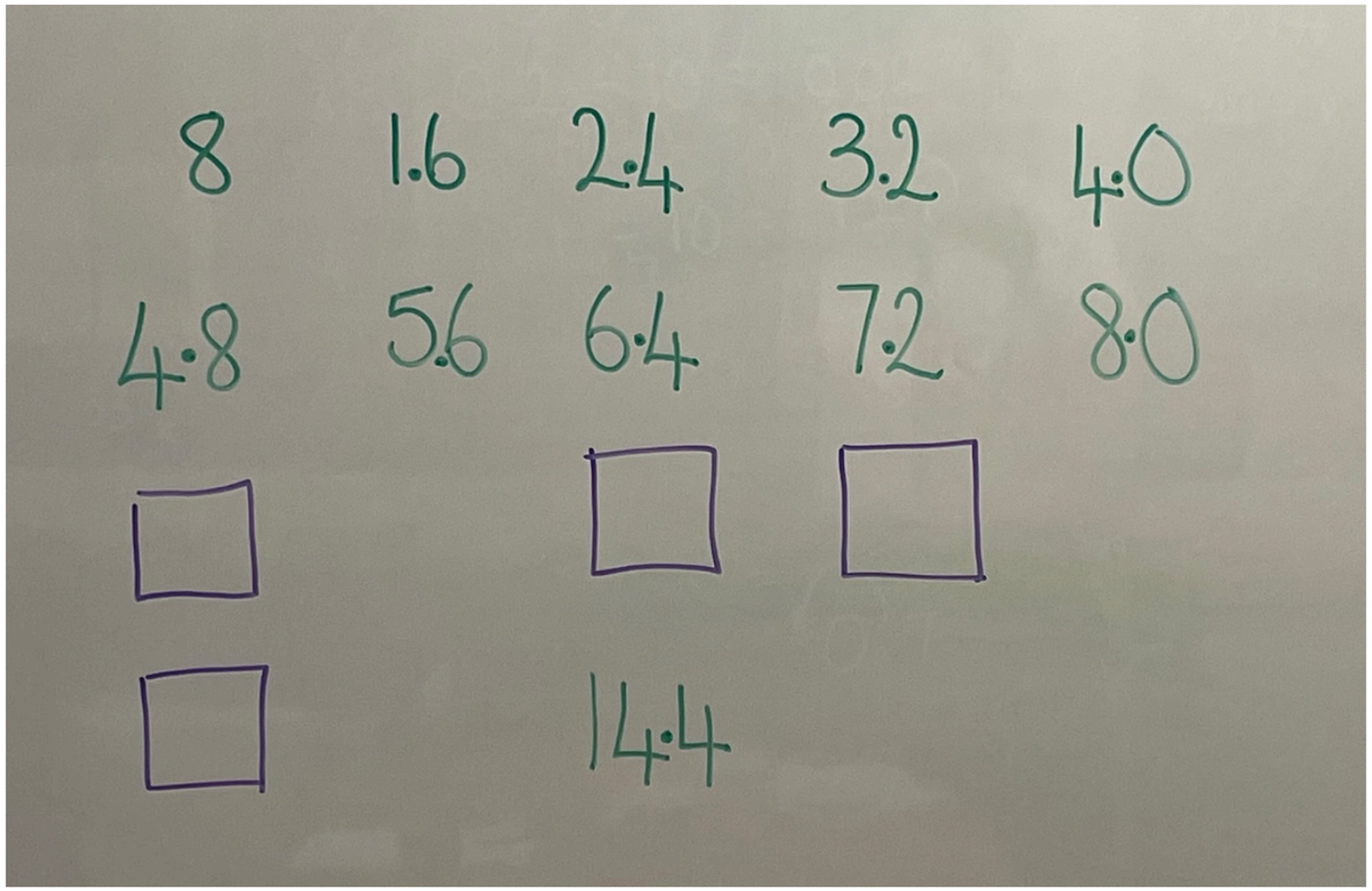
8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96

Multiples of 8 can be halved, halved and halved again to leave a whole number e.g. 40 (20, 10 and 5)



Multiples are always even - (just like the 4s!)

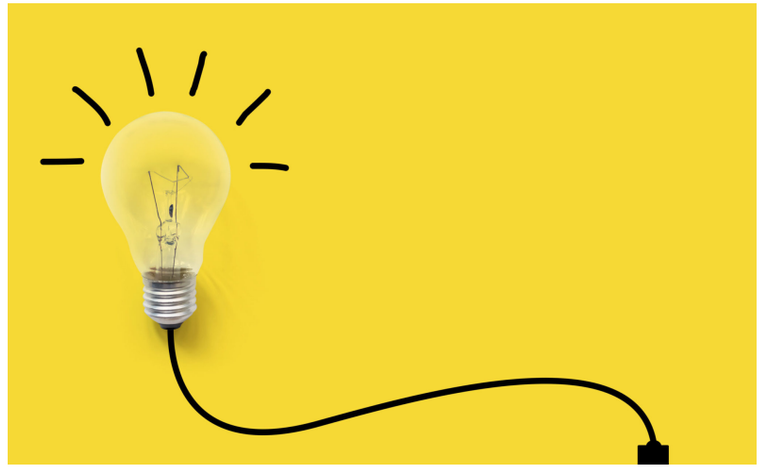
Adding Challenge!



The Nines!

9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99 and 108

Pattern of 'ones' decreasing by 1 and 'tens' increasing

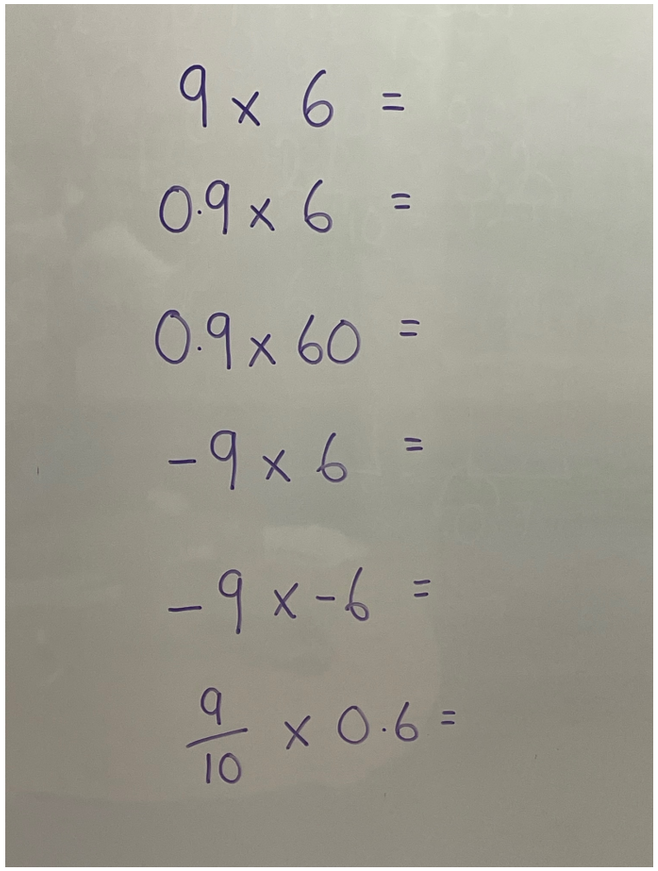


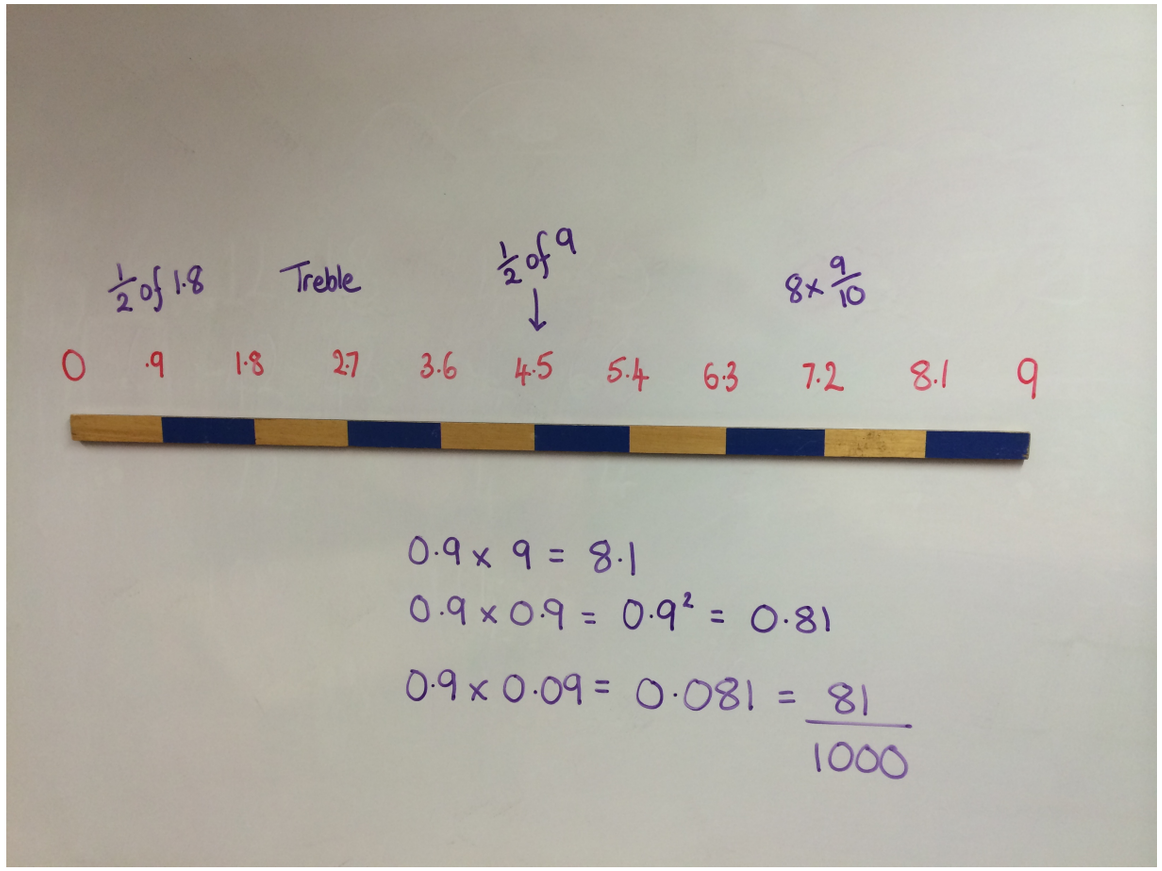
Digital root of 9

Reversible numbers e.g. 18 and 81, 108 and 801

Adding Challenge!

Investigating numbers with a **digital root of 9**
e.g. 432, 7611 and 53232 etc.



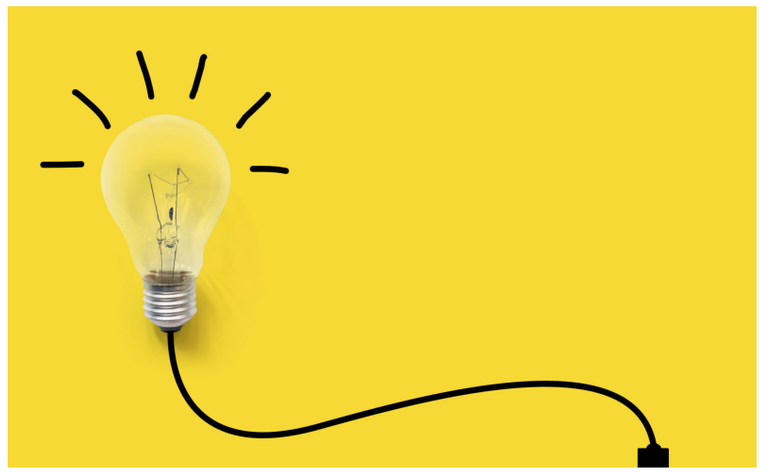


The Elevens!

11, 22, 33, 44, 55, 66, 77, 88, 99, 110, 121 and 132

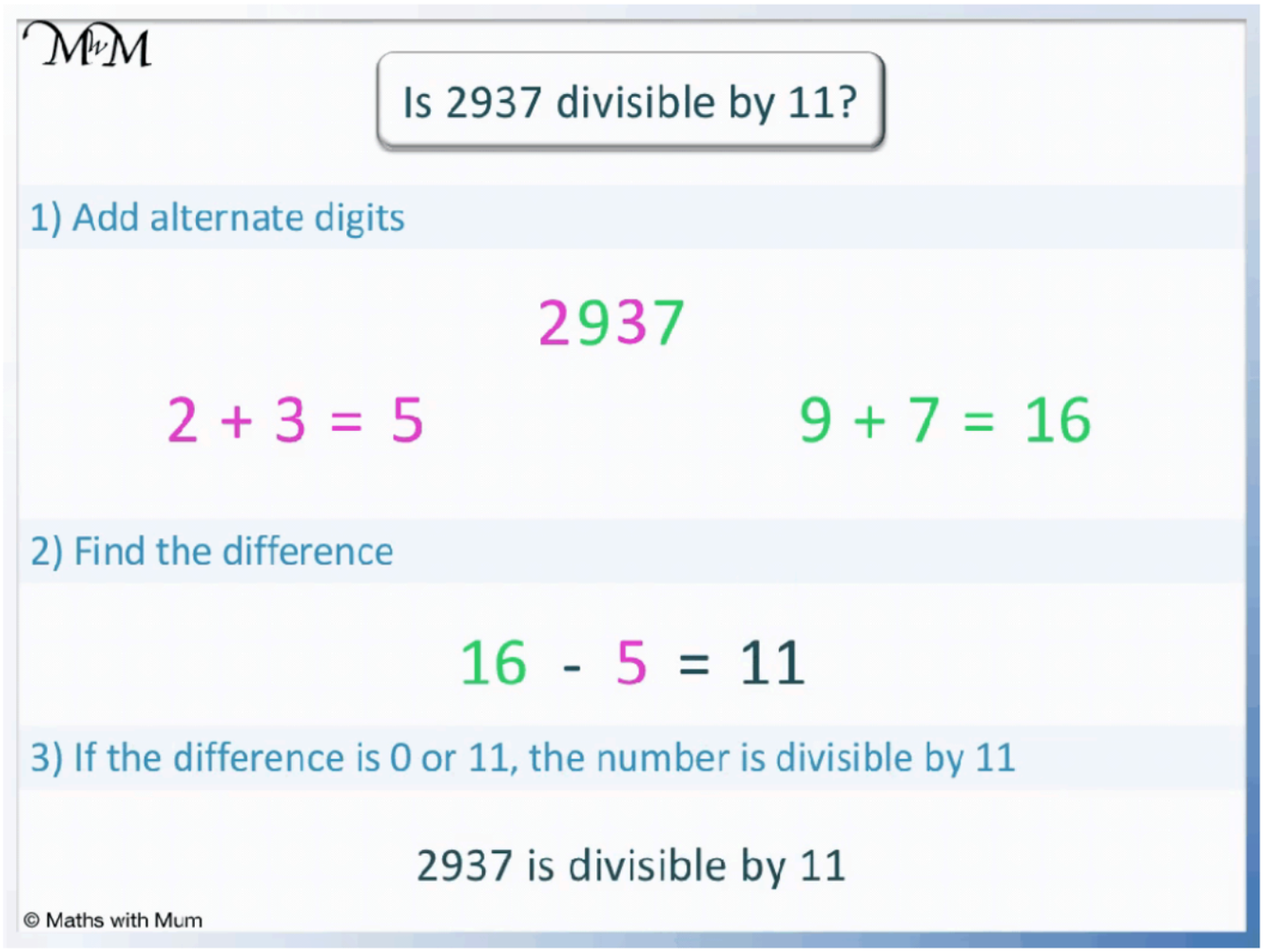
Palindromic numbers

Multiply by 10 and add '1 more lot'
e.g. 15 x 11 = 150 + 15



Add 10 and then add 1 e.g. the next multiple of 11, after 33 (43+1)

Adding Challenge!

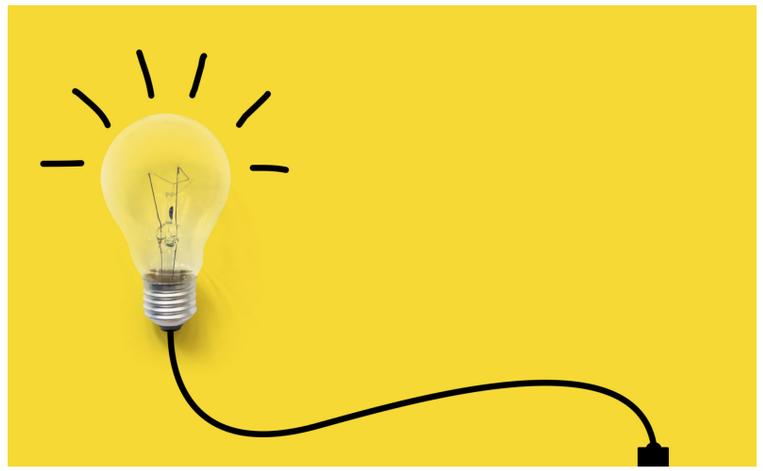


The Twelves!

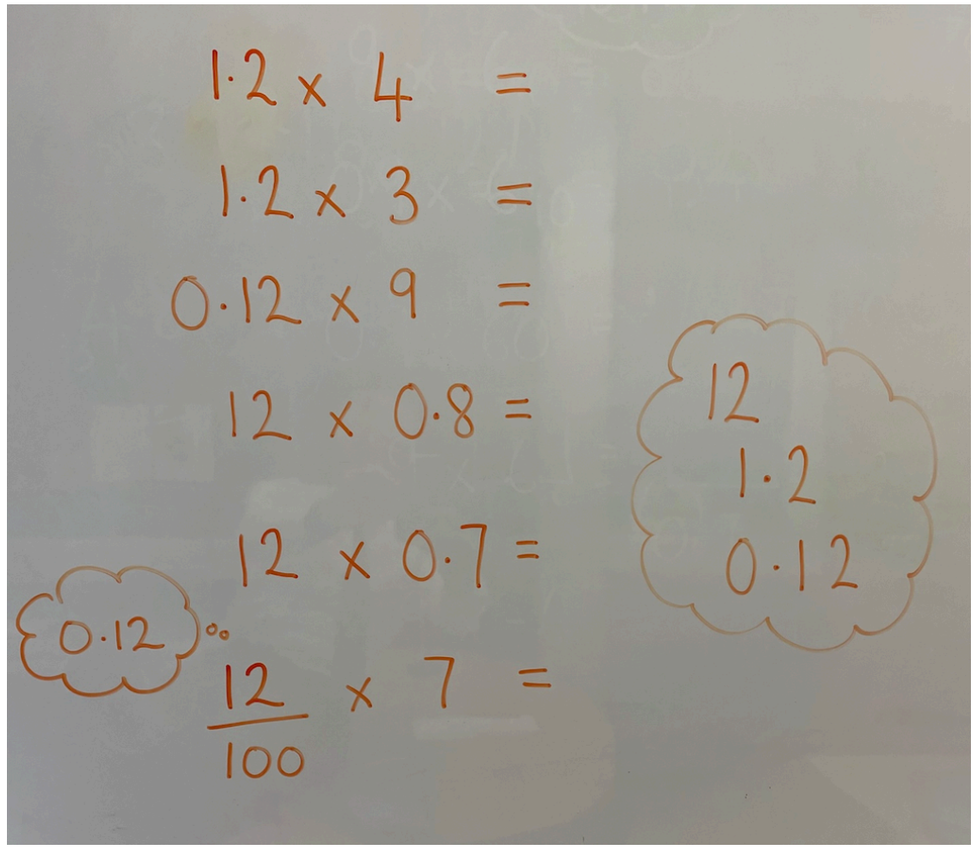
12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132, 144

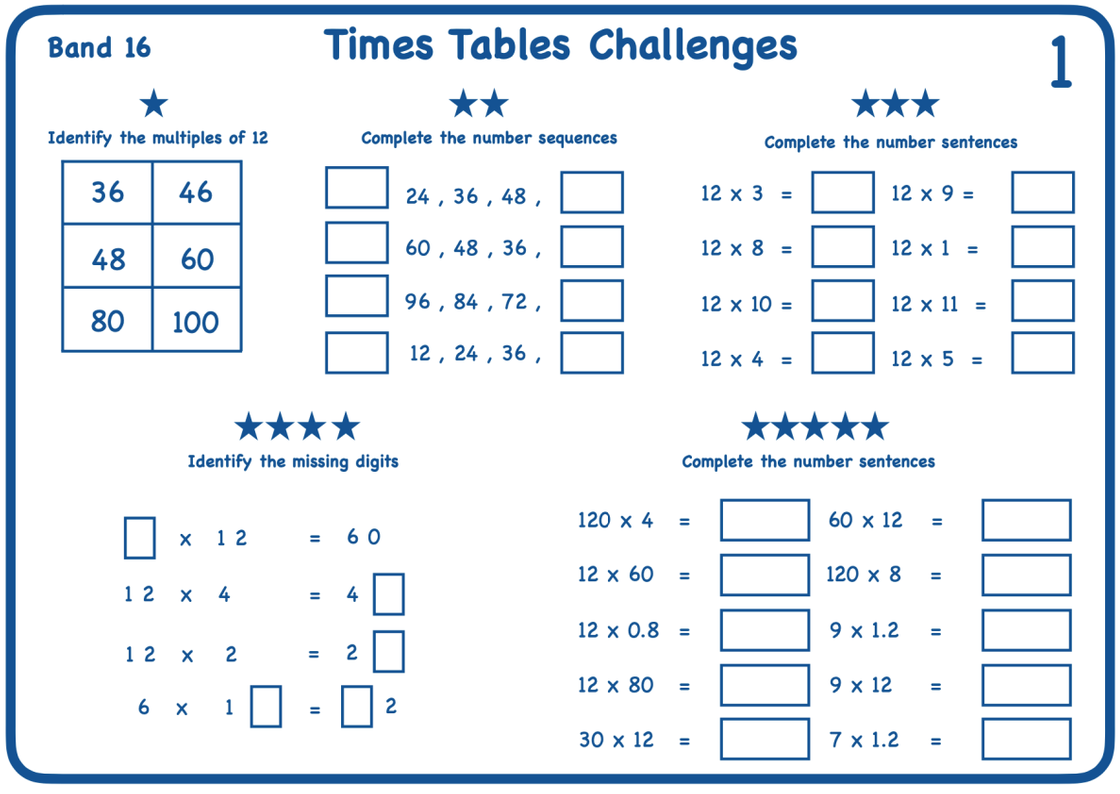
Always even

Pattern of 2, 4, 6, 8 and 0!



Adding Challenge!





Band 16

Times Tables Challenges

1

★ Identify the multiples of 12

36	46
48	60
80	100

★★ Complete the number sequences

□ 24 , 36 , 48 , □

□ 60 , 48 , 36 , □

□ 96 , 84 , 72 , □

□ 12 , 24 , 36 , □

★★★ Complete the number sentences

12 x 3 = □ 12 x 9 = □

12 x 8 = □ 12 x 1 = □

12 x 10 = □ 12 x 11 = □

12 x 4 = □ 12 x 5 = □

★★★★ Identify the missing digits

□ x 12 = 60

12 x 4 = 4□

12 x 2 = 2□

6 x 1□ = □2

★★★★★ Complete the number sentences

120 x 4 = □ 60 x 12 = □

12 x 60 = □ 120 x 8 = □

12 x 0.8 = □ 9 x 1.2 = □

12 x 80 = □ 9 x 12 = □

30 x 12 = □ 7 x 1.2 = □

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