

# What maths looks like at our school

And how you can help at home 😊

# This is our philosophy

- Everyone can learn maths. We encourage a growth mindset.
- Mastery approach to learning where children's understanding is deepened
- Concrete, Pictorial, abstract (CAP) approach to ensure a solid understanding
- Problem solving and reasoning takes place in every objective
- We make cross curricular links wherever possible

# What maths looks like in our school:

- Access to manipulatives/concrete resources to support understanding
- Flexible mixed ability groupings for some lessons which allows children to work with different children and to ensure challenge
- Lots of talk and reasoning
- Problem solving throughout
- Opportunities to practise and become fluent in calculation methods
- Mini-plenaries to share misconceptions, pose questions, challenge ideas

# How does it work?

- Structured problems which challenge thinking and allow children to expose patterns and opportunities for “making connections”
- In some lessons, children choose their own entry point to challenge themselves. All challenges are linked, promoting the mastery approach.
- Focus on specific mathematical language, especially when explaining why.
- Regular links to “real world” maths
- Regular practice of times tables through chanting, singing and games
- Many opportunities to talk mathematically
- Reasoning activities such as : True/False, Prove It, Always, Sometimes, Never.

- When needed, children are given time to review a task in the following session or later that day. Sessions are fluid and intervention is rapid.
- Teachers may pre-teach a concept ahead of the lesson too, to help build confidence or enable children to access the lesson

# Where are we heading?

- By the end of year 2

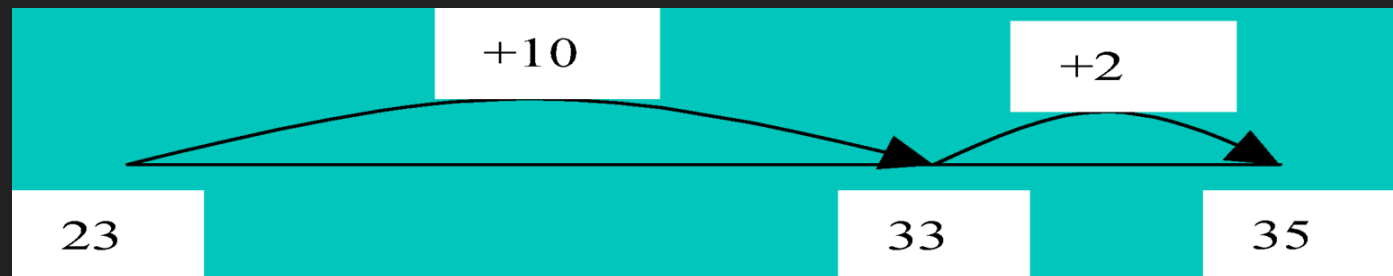
Using numberlines to develop understanding of:

- Counting on in tens and ones

- $23 + 12 = 23 + 10 + 2$

- $= 33 + 2$

- $= 35$

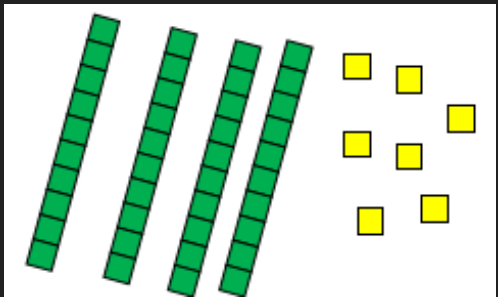


# Towards a Written Method

Partitioning in different ways and recombine

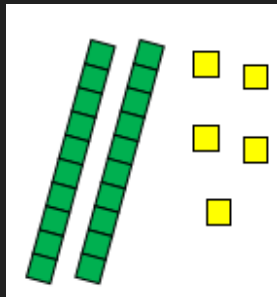
$47 + 25$

47



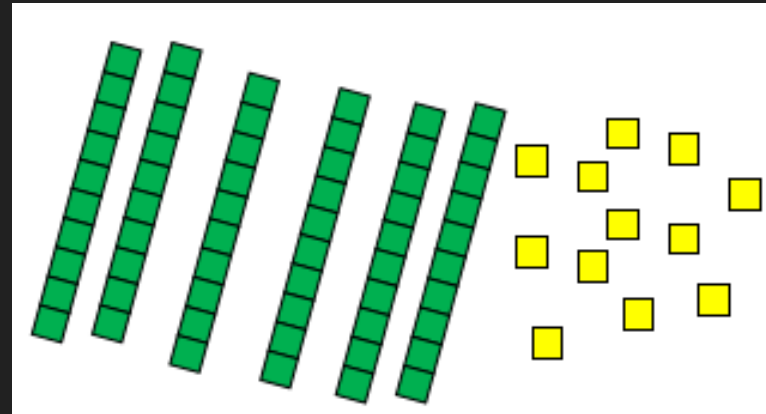
+

25



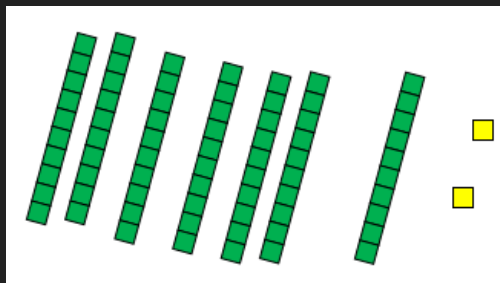
=

60 + 12



Leading to exchanging:

72



Expanded written method

$40 + 7 + 20 + 5 =$

$40 + 20 + 7 + 5 =$

$60 + 12 = 72$

$$\begin{array}{r} 40 + 7 \\ + 20 + 5 \\ \hline 60 + 12 = 72 \end{array}$$

□ 34 Adding in columns, no regrouping

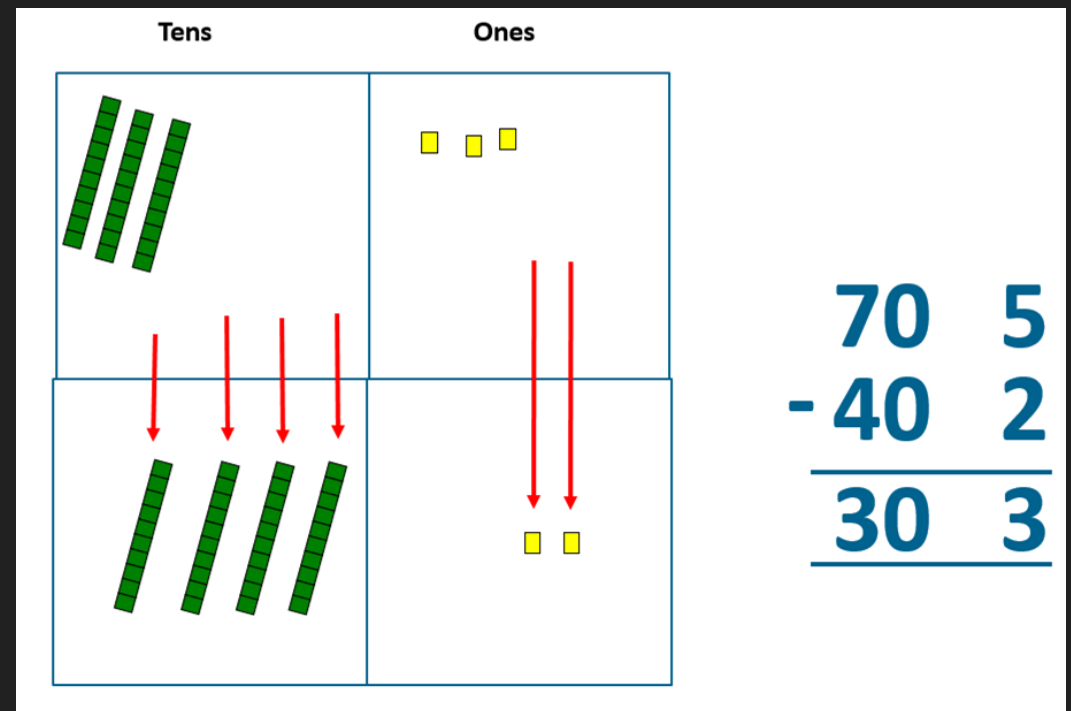
$$\begin{array}{r} 12 \\ \hline \end{array} +$$

$$\begin{array}{r} 46 \\ \hline \end{array}$$

# Subtraction

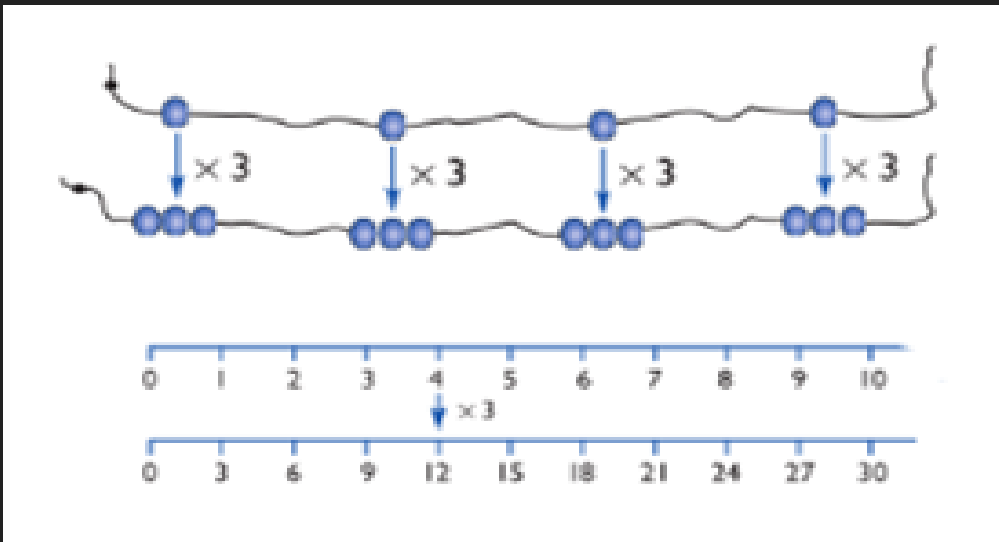
## Towards written methods

- Recording addition and subtraction in expanded columns can support understanding of the quantity aspect of place value and prepare for efficient written methods with larger numbers. The numbers may be represented with Dienes apparatus. E.g.  $75 - 42$



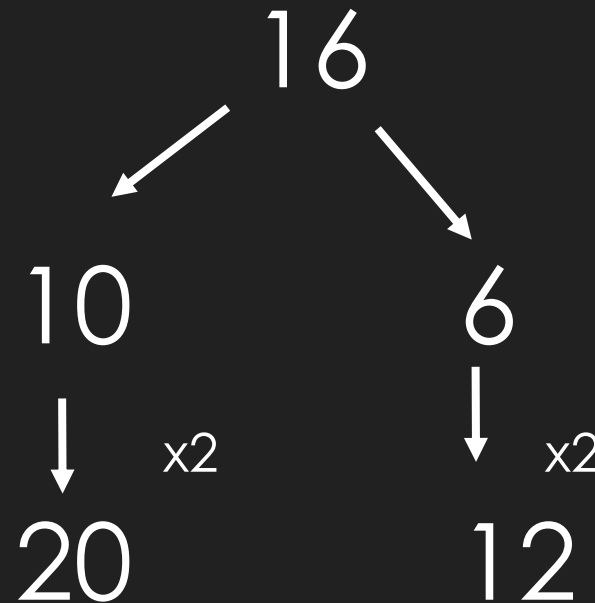
# Multiplication

- Doubling numbers up to  $10 + 10$   
Link with understanding scaling
- Using known doubles to work out double 2 digit numbers  
(double 15 = double 10 + double 5)



## Towards written methods

- Use jottings to develop an understanding of doubling two digit numbers.



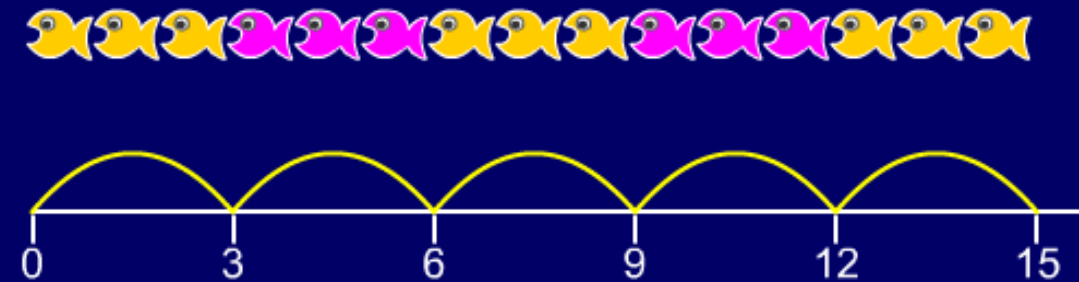
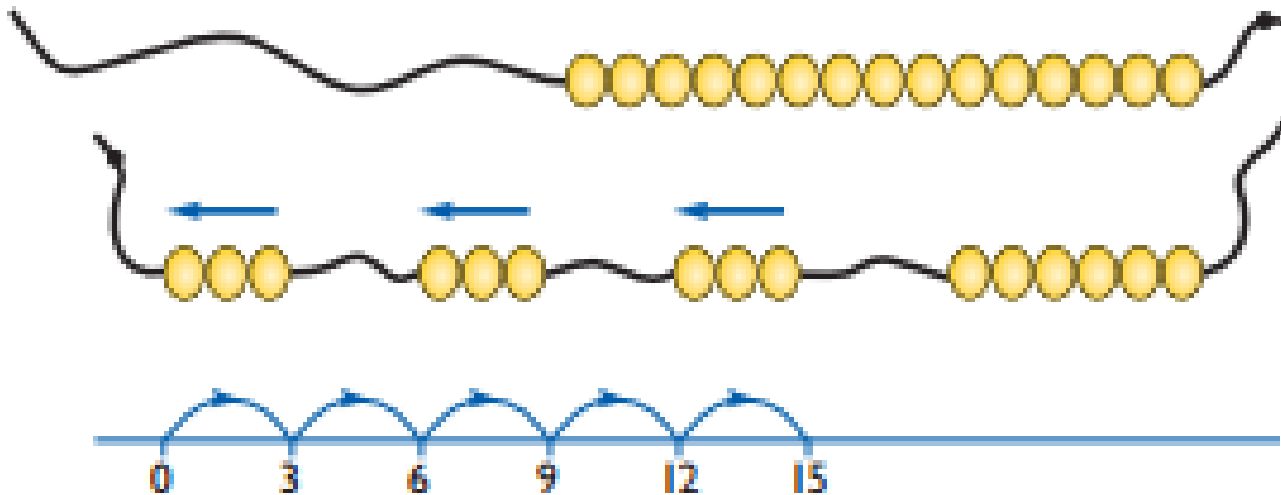
Should know their 2, 5, 10 times tables

## ➤ DIVISION

### ➤ Grouping using a numberline

Group from zero in jumps of the divisor to find our 'how many groups of 3 are there in 15?'.  
15 ÷ 3 = 5

$$15 \div 3 = 5$$



- Continue work on arrays. Support children to understand how multiplication and division are inverse. Look at an array – what do you see?

# Year 4

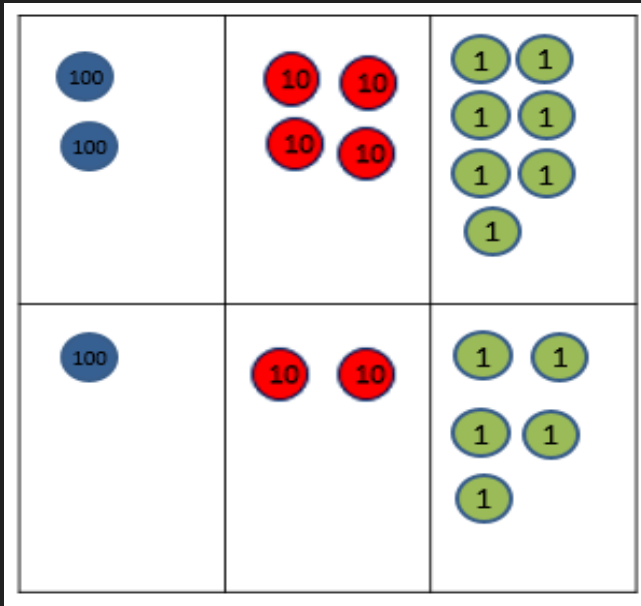
Children should know ALL of their times tables by the end of year 4 and how to use the inverse (division) facts.

- TT Rockstars
- Songs (Youtube- Mr De Maio)
- Skip counting as a first step

# By the end of year 6

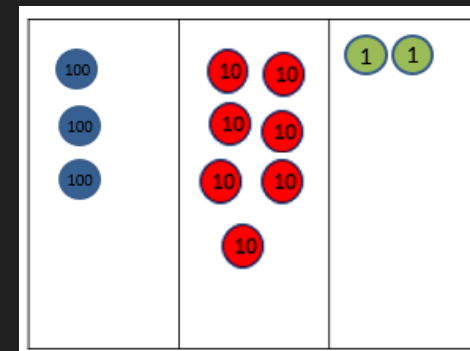
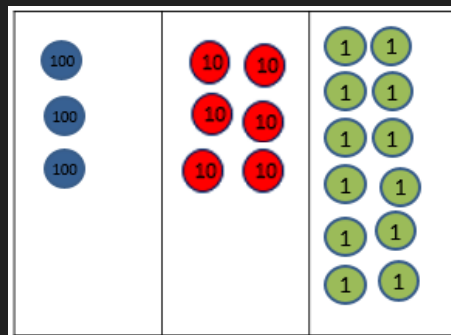
- Written formal methods of calculation
- Taught in steps so children understand the process, not just copy it

# Towards a Written Method



$$\begin{array}{r}
 200 + 40 + 7 \\
 100 + 20 + 5 \\
 \hline
 300 + 60 + 12 = 372
 \end{array}$$

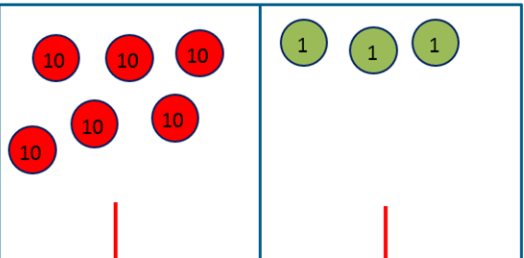
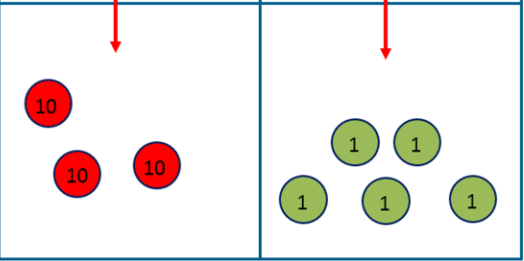
$$\begin{array}{r}
 247 \\
 +125 \\
 \hline
 12 \\
 60 \\
 300 \\
 \hline
 372
 \end{array}$$



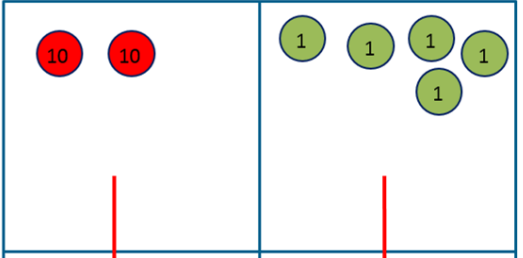
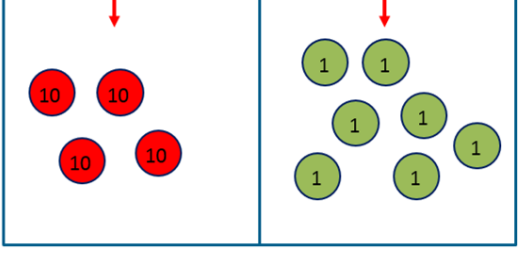
Leading to children understanding the exchange between tens and ones.

## Written methods (progressing to 3-digits)

Introduce expanded column subtraction with no decomposition, modelled with place value counters (Dienes could be used for those who need a less abstract representation)

		$\begin{array}{r} 908 \\ - 305 \\ \hline 603 \end{array}$
---	---	---

Leading to exchanging

		$\begin{array}{r} \overset{60}{\cancel{70}} \overset{1}{2} \\ - 407 \\ \hline 205 \end{array}$
---	---	--

$$\begin{array}{r} \overset{6}{\cancel{7}} \overset{1}{2} \\ - 47 \\ \hline 25 \end{array}$$



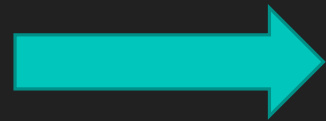
Leading to formal, compact method with exchanging.

## Written methods (progressing to 3d x 2d)

Children to begin column multiplication, beginning with 2digit numbers by 1 digit numbers. By end of year 6, working with much larger numbers.

x	30	4
3	90	12

$$\begin{array}{r} 90 \\ +12 \\ \hline 102 \end{array}$$



$$34 \times 3$$

$$\begin{array}{r} 34 \\ \times 3 \\ \hline 12 \\ + 90 \\ \hline 102 \end{array}$$



$$\begin{array}{r} 34 \\ \times 3 \\ \hline 102 \\ 1 \end{array}$$

Use grid method to explore why this works- a focus on place value

# Year 3/4

## Formal Written Methods

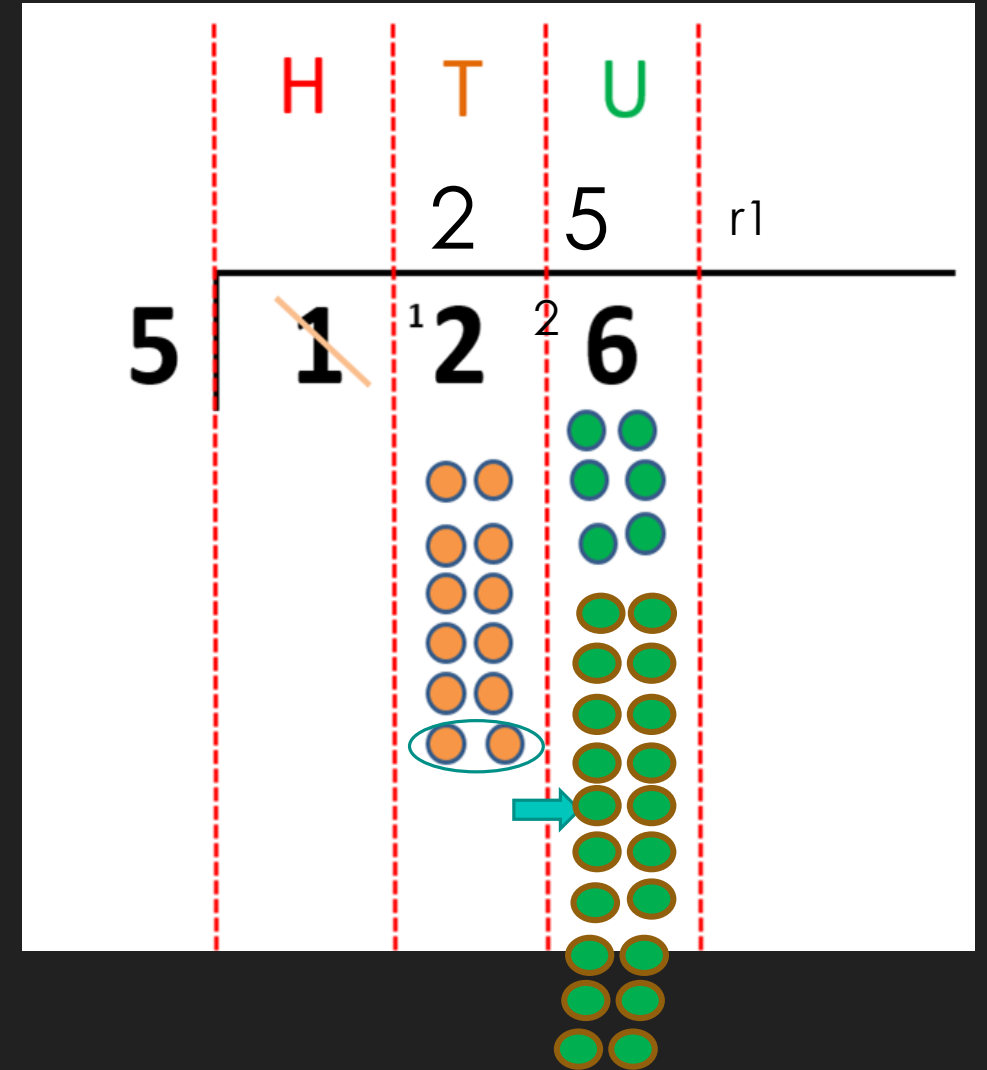
Formal short division should only be introduced once children have a good understanding of division and its links with multiplication.

Short division to be modelled for understanding using place value counters as shown below. Calculations with 2 and 3-digit dividends.

# Year 5 and 6

Children begin to practically develop their understanding of how express the remainder as a decimal or a fraction. Ensure practical understanding allows children to work through this (e.g. what could I do with this remaining 1? How could I share this between 6 as well?)

$$\begin{array}{r} 239 \text{ r}1 \\ 6 \overline{) 1435} \end{array}$$



## Year 6

### Formal Written Methods – long and short division

Children to produce jottings or “Magic Multiplication Facts” to aid their work and to reinforce the link to multiplication.

Children to also represent remainders as a decimal.

$$15 \overline{) 2364.0} \quad \begin{matrix} 157.6 \\ \phantom{0} \end{matrix}$$

#### JOTTINGS

$$1 \times 15 = 15$$

$$2 \times 15 = 30$$

$$5 \times 15 = 75$$

$$10 \times 15 = 150$$

$$20 \times 15 = 300$$

# TOP TIPS

POSITIVE MINDSET

DEVELOP  
MEMORY SKILLS

MATHS TALK  
EVERYDAY

MATHS GAMES-  
TECHNOLOGY  
TOO!

TIME

SHAPES

MEASURES

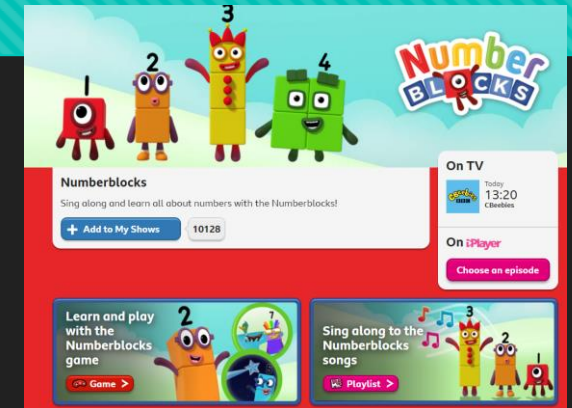
OPEN QUESTIONS

FRACTIONS

PROBLEM SOLVING

# How can you help?

## Mathematical Talk



- <http://www.familymathstoolkit.org.uk/>
- <https://www.oxfordowl.co.uk/for-home/advice-for-parents/>
- <https://www.bbc.co.uk/cbeebies/shows/numberblocks>
- <https://www.topmarks.co.uk/maths-games/hit-the-button>
- Mr De Maio on YouTube Times Tables
- Khan Academy on YouTube
- Maths 4 Kids on Facebook and YouTube

