



Godalming Junior School

# How to help your child with Maths

Perhaps the single most important thing that parents can do to help their children with maths is to pass on a positive attitude.

*Tanya Byron, Clinical Psychologist*

# Purpose

- ▶ To help parents understand Maths at GJS - so you can support your children
- ▶ To signpost further resources to support you in supporting your child



# MOST IMPORTANT SLIDE!

## Fluency & confidence with numbers - Play, play, play!

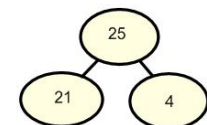
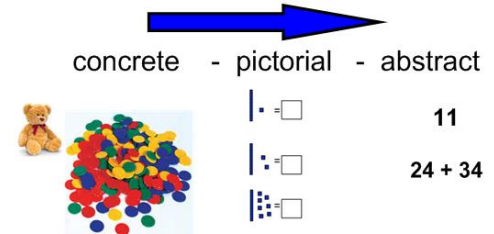
- ▶ Games for counting - Ludo, snakes & ladders
- ▶ Games with money - Monopoly
- ▶ Card games - Stop the bus, Elevens, Gamewright games etc
- ▶ Real-life application
  - ▶ Cooking/weighing
  - ▶ Shopping (estimating costs, combining coins, giving change)
  - ▶ Telling the time
  - ▶ Using timetables
- ▶ Online maths games
  - ▶ TTRockstars
  - ▶ Hit the Button
  - ▶ Mathsframe
  - ▶ Cool Maths Games

# Making sense of schoolwork...

Maths may look very different to how it did when you were at school.

The big change is that rather than just learning methods for working out calculations, children spend a lot more time understanding why these methods work and explaining how they know (reasoning). We use different **representations** to help us with this. (More on this in a moment!)

As children go through the school, they will also learn to use the formal written methods that you may be more familiar with. Children are then expected to apply this undertaking to problem solving. (This is where your talking about numbers in contexts will be so helpful).



# Making sense of schoolwork...

## Representations





- ▶ Place value grids
- ▶ Dienes / Base 10
- ▶ Place value counters
- ▶ 10 frames
- ▶ Bar models
- ▶ Part-part-whole model
- ▶ Number lines

# Dienes / Base 10



Dienes are used to secure children's understanding of place value.

We use dienes to show what happens when we add and subtract across columns as a stepping stone to using formal written methods.

<u>hundreds</u>	<u>tens</u>	<u>units</u>
		
		

$$\begin{array}{r} 43 \\ + 26 \\ \hline \\ \hline \end{array}$$


# Place value counters


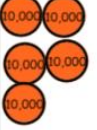

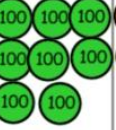
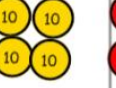



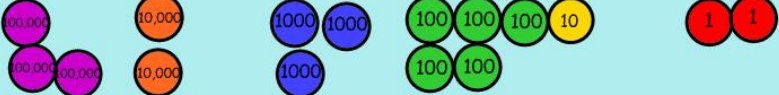
Place value counters are another resource used to help children's understanding of place value.

We use dienes and place value counters along with place value grids.

They may be seen in problems as well!

 Bradley chooses 9 counters and uses them to make a 6 digit number. What number could he add to 357,846?

H	Th	T	Th	H	T	O
						
+ _____						

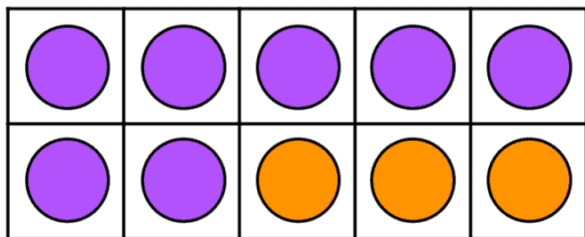


# 10 frames

- ▶ Used to model number bonds to 10, to 100, to 1000 and in decimals and tenths
- ▶ Egg box ten frames can be useful to secure number bonds if they are insecure.

Supporting questions might include:

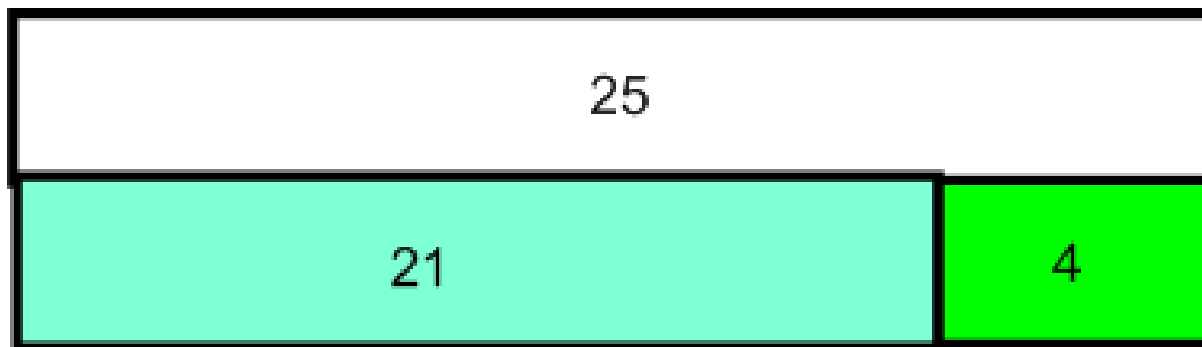
How many counters do I have? How many more do I need to get to 10?  
If I had ten and I took 3 away, how many would I have left?





# Bar models

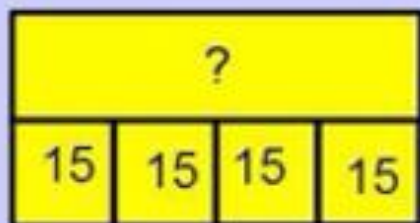
- ▶ Bar models are where pictures of bars are used to represent calculations and word problems.
- ▶ They are used for all four operations.
- ▶ They do not “solve” problems, but can help children visualise what the problem is and then how to solve it.
- ▶ This bar model could be used to represent addition or subtraction.



$$\begin{aligned} 25 &= 21 + 4 \\ 25 &= 4 + 21 \\ 25 - 4 &= 21 \\ 25 - 21 &= 4 \end{aligned}$$

# Bar models

Whole unknown...



4 children go to the cinema. They each pay £15. How much do they spend altogether?

Size of groups unknown...



4 children go to the cinema. They each pay £60 altogether. How much do they spend each?

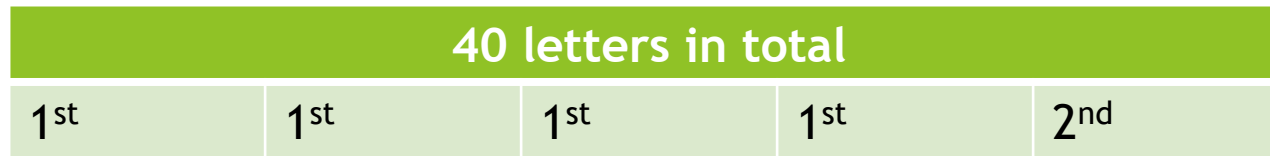
- ▶ The Bar Model Company has some videos here:
- ▶ [https://www.youtube.com/channel/UC5gj9\\_s0Tibd1C8HW5a0kaQ/videos](https://www.youtube.com/channel/UC5gj9_s0Tibd1C8HW5a0kaQ/videos)

# Using a bar model to problem solve:

Ralph posts 40 letters, some of which are first class, and some are second.

He posts four times as many second class letters as first.

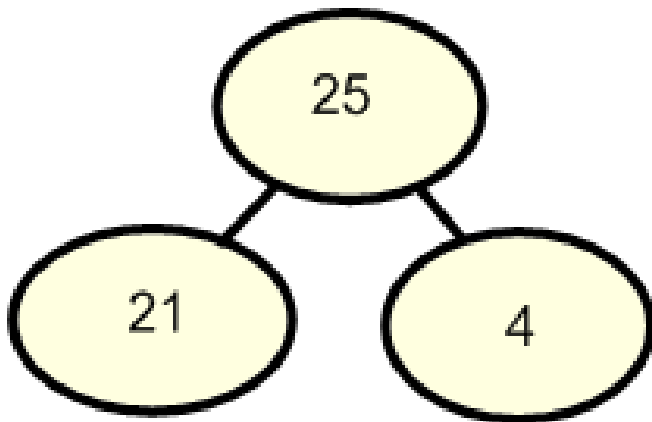
How many of each class of letter does he post?



- ▶ Here, we can see that there are 4 times as many 1<sup>st</sup> class letters as 2<sup>nd</sup> class. - So we have 5 “parts”.
- ▶ One of these parts is the 2<sup>nd</sup> class letters ( $40 / 5 = 8$  second class)
- ▶ Four of these parts are the 1<sup>st</sup> class letters ( $8 \times 4 = 32$  first class)

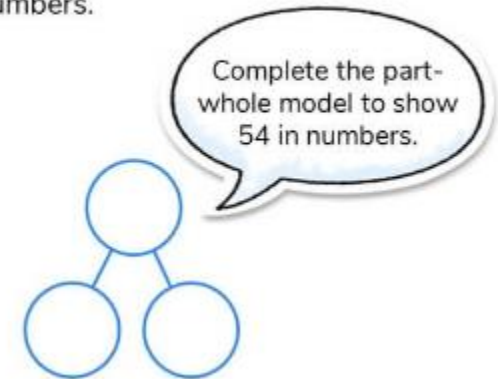
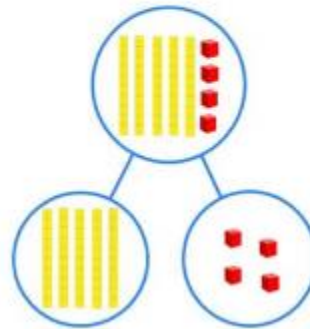
# Part - part - whole

- ▶ A part-whole model is a useful diagram that shows a number split into parts.
- ▶ Children may be asked to find missing values in a part-whole model in problem solving.



The number 54 can be broken down into its tens and ones.

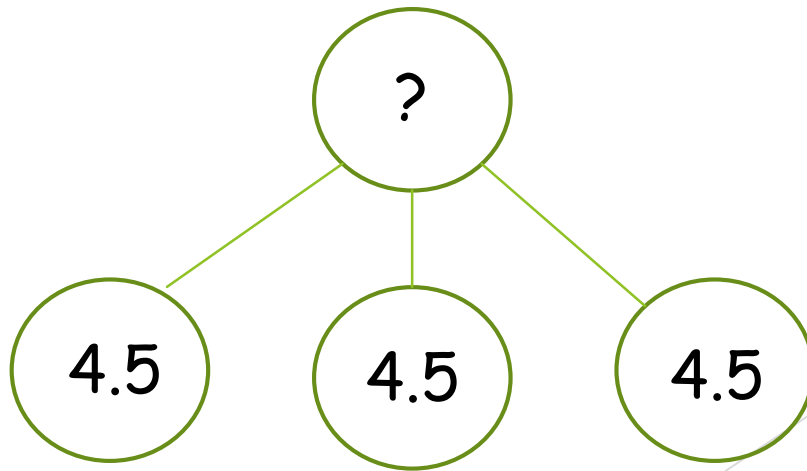
We can show this using pictures or numbers.



Children may be asked to find missing values in these representations.

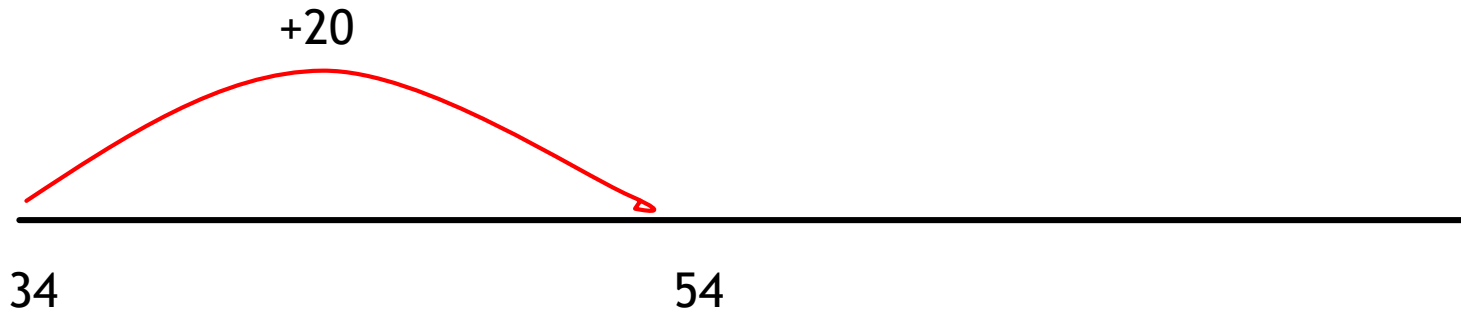
They may then use formal written methods to solve the problem.

?				
17	17	17	17	17



# Number lines

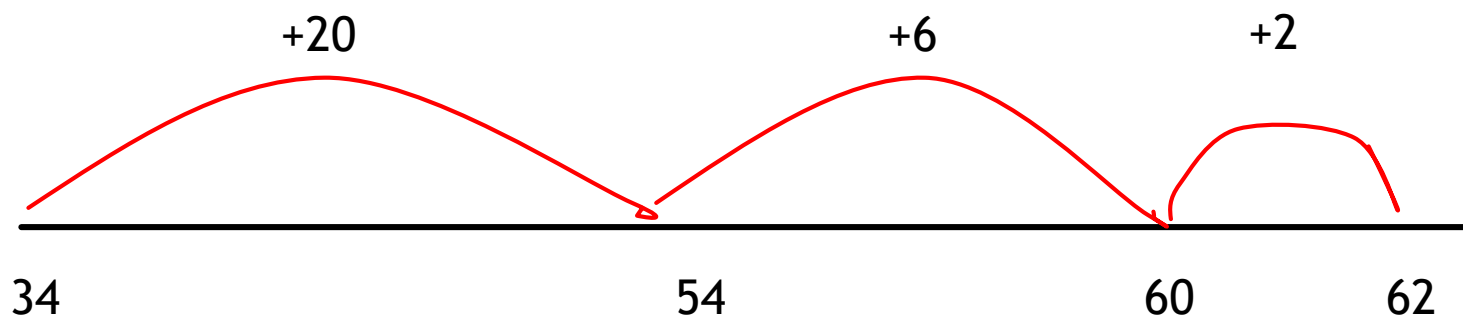
- ▶ Initially, number lines will be marked.
- ▶ Support for mental methods



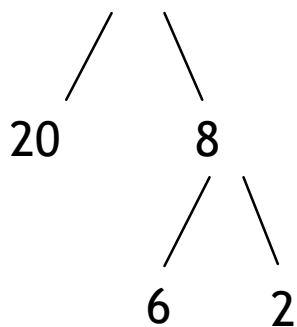
$$34 + 28 =$$

# Number lines

- ▶ Initially, number lines will be marked.
- ▶ Support for mental methods



$$34 + 28 =$$



# Reasoning

- ▶ This way of working builds a deeper understanding of how numbers are put together. This then supports children in being able to reason mathematically.

JIM

$$\begin{array}{r} 725 \\ -147 \\ \hline 622 \end{array}$$

reasoning

Jim has made a mistake because you cannot do 5-7 in the ones column. He needs to exchange in the tens column. Also the tens column you cannot subtract 4 from 2. It should be 2 minus 4. He should have exchanged and used a hundred from the next column to make 12 tens minus 4 tens.



# Formal written methods

- ▶ Column methods for addition and subtraction
- ▶ Multiplication and division may show “expanded” methods initially

$$\begin{array}{r} 160 \\ + 24 \\ \hline 184 \end{array}$$

$$\begin{array}{r} 23 \\ \times 8 \\ \hline 184 \\ \substack{1 \quad 2} \end{array}$$

$$\begin{array}{r} 23 \\ \times 8 \\ \hline 24 \quad (8 \times 3) \\ 160 \quad (8 \times 20) \\ \hline 184 \end{array}$$

$$7 \overline{)928}$$

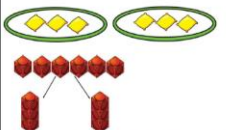
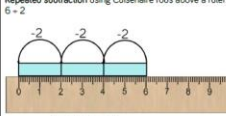

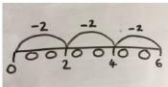
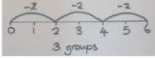
# Year 4 times tables check

- ▶ Fluency in times tables IS very useful for children to develop. As they go up the school, it helps them with multiplication, division and fractions.
- ▶ **Repetition, games and songs** can all help develop a more secure recall of times tables.

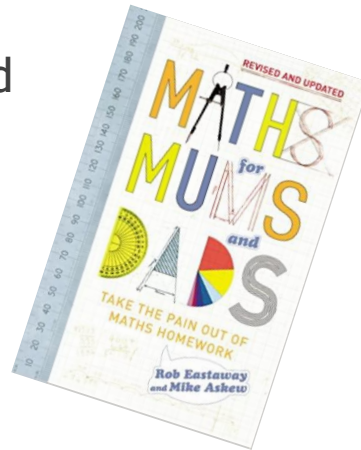


# Further resources

- ▶ GJS Maths Calculation Policy
  - ▶ (GJS website, About the school/Policies/Maths Calculation Policy)

Concrete	Pictorial	Abstract		
<p>Sharing using a range of objects. <math>6 \div 2</math></p>  <p>Repeated subtraction using Cuisenaire rods above a ruler. <math>6 \div 2</math></p>  <p>3 groups of 2</p>	<p>Represent the sharing pictorially.</p>  <p>Children to represent repeated subtraction pictorially.</p> 	<p><math>6 \div 2 = 3</math></p> <table border="1"><tr><td>3</td><td>3</td></tr></table> <p>Children should also be encouraged to use their 2 times tables facts.</p> <p>Abstract number line to represent the equal groups that have been subtracted.</p>  <p>3 groups</p>	3	3
3	3			

- ▶ Home Learning | White Rose Maths
  - ▶ White Rose “Home Learning” video lessons:
- ▶ Book: Maths for Mums and Dads



- ▶ Online games:
  - ▶ TTRockstars  
[ttrockstars.com](https://www.ttrockstars.com)
  - ▶ Hit the button:  
<https://www.topmarks.co.uk/maths-games/hit-the-button>
  - ▶ Maths frame  
[mathsframe.co.uk](https://www.mathsframe.co.uk)
  - ▶ Cool Maths Games:  
<https://www.coolmathgames.com/>



# Most of all, try to make Maths fun and meaningful!

Perhaps the single most important thing that parents can do to help their children with maths is to pass on a positive attitude.

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