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# Maths Parent Information Session

I ♥  
MATHS

**MATHEMATICS**  
is not about  
numbers, equations,  
computations, or  
algorithms:  
it is about  
**UNDERSTANDING.**

*William Paul Thurston*



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## What will we cover?

- The maths curriculum
- Fluency and Key Instant Recall Facts (KIRFS)
- Maths mastery
- Our calculation policy
- Time to explore resources and ask questions



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## 2014 Curriculum

- Number & Place Value
- Addition, Subtraction, Multiplication & Division
- Fractions (decimals & percentages)
- Ratio & Proportion
- Algebra
- Measurement
- Properties of Shape
- Position & Direction
- Statistics



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## 2014 Curriculum

Focus on:

- Fluency
- Reasoning
- Problem solving



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## Fluency

To be fluent in mathematics children should be able to...

- grasp the fundamentals of mathematics - practice arithmetic skills
- make connections
- become more confident with written and mental methods
- be confident with what they are doing and why
- recall and apply their knowledge rapidly and accurately



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## Reasoning

Through reasoning problems children should...

- be able to explain why an answer is right or wrong
- follow a line of enquiry to a logical conclusion
- prove theories using mathematical language

Which would you  
rather have?

2 x 5 toys

or

5 x 2 toys

A quarter is when we share something into two equal pieces.

True or false?



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## Problem Solving

Children should be able to...

- apply their mathematics to a variety of routine and non-routine situations
- put maths into context
- break down problems into a series of manageable steps

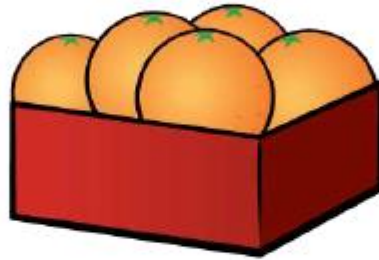




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I Des has some oranges.  
He packs them into boxes.  
Each box holds 5 oranges.



He fills 7 boxes.  
He has 29 oranges left.  
How many oranges does he have in total?



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## Supporting children's mathematical understanding

Concrete  
Pictorial  
Abstract



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## Supporting children's mathematical understanding

### Concrete

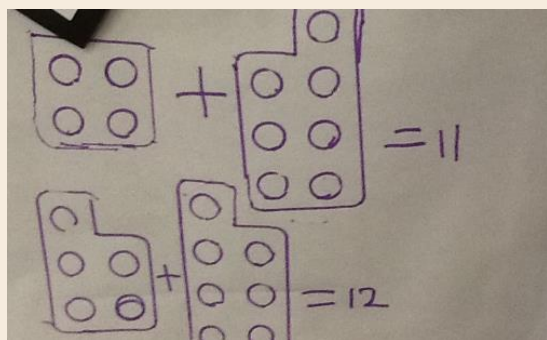
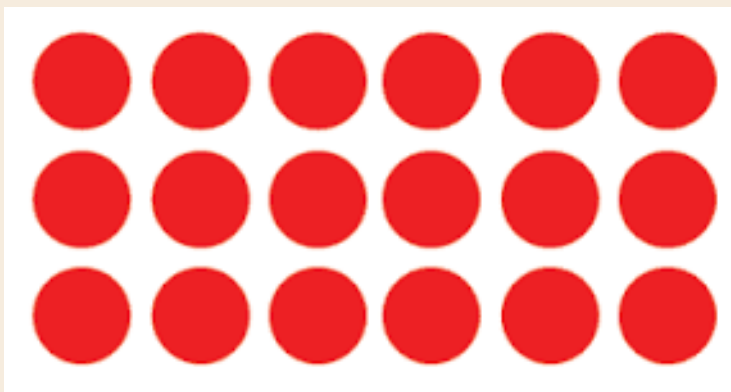




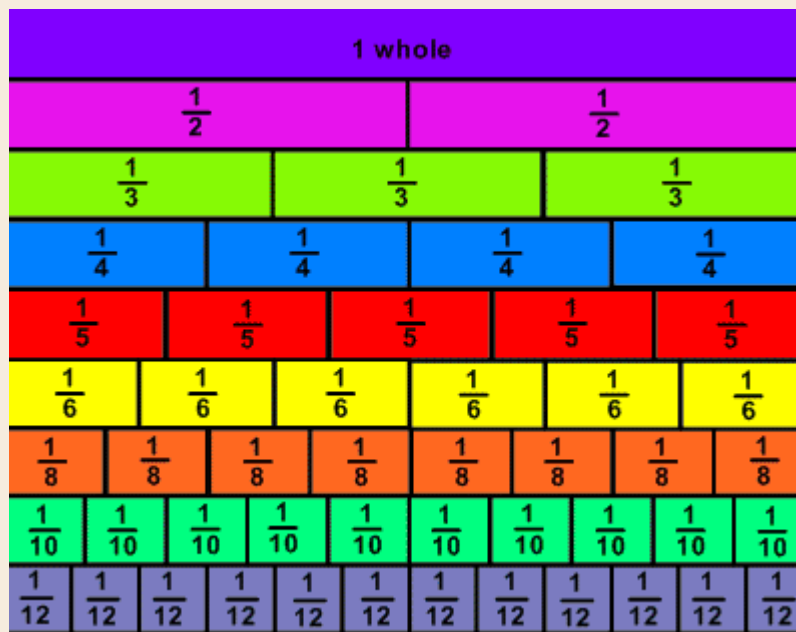
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## Pictorial



3	?
7	





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## Abstract

$$2 \times 5 = 10$$

$$66 + 32 = 98$$

$$12 + \square = 17$$





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## Key Instant Recall Facts - KIRFs



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## Key Instant Recall Facts - KIRFs

- Termly objectives
- Years Reception to 6
- Improve children's fluency
- Instant recall of facts

What are the best ways to work on these facts?



## Key Instant Recall Facts

Year 1 – Autumn 1

### I can count, read and write numbers to 100

By the end of this half term, children should know the following facts. The aim is for them to recall these facts **instantly**.

- ▶ I can count forwards to 100
- ▶ I can count in ones starting at any number up to 100
- ▶ I can count backwards from 100
- ▶ I can count backwards from 100 starting at any number
- ▶ I can write numbers to 100
- ▶ I can recognise numbers to 100

#### Key vocabulary

Forwards  
Backwards

#### Top Tips

The secret to success is practising **little** and **often**. Use time wisely. Can you practise these KIRFs while walking to school or during a car journey? You don't need to practise them all at once: perhaps you could have a fact of the day.

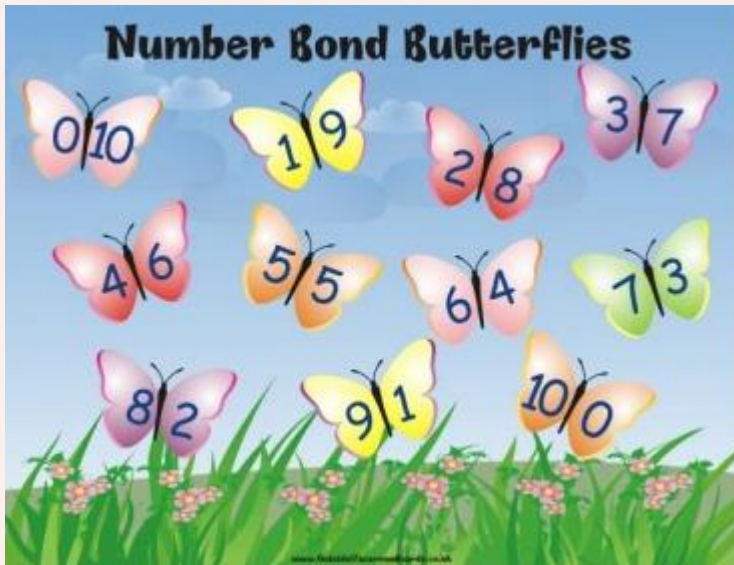
Use practical resources – Grab handfuls of pasta or buttons and ask your child to count them



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## Key Instant Recall Facts - KIRFs



?

<https://www.bbc.co.uk/sport/supermovers/42612496>

<https://www.bbc.co.uk/sport/supermovers/42675177>





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## What is Mastery?

Means that learning is sufficiently:

- Embedded
- Deep
- Connected
- Fluent

In order for it to be:

- Sustained
- Built upon
- Connected to



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## A Mastery Curriculum

Shallow  
Learning

- Surface learning,
- Temporary, often lost

Meeting  
Expectations

- With support being able to meet the objectives outlined in the National Curriculum

Mastery

- Obtaining greater level of understanding and being able to apply learning in different context

Working at  
Greater Depth

Learning be transferred and applied in different contexts  
Pupils can explain their understanding to others

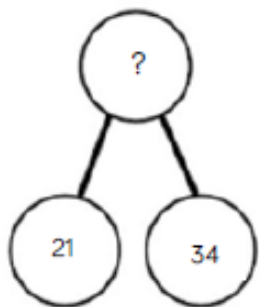


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## A Mastery Curriculum

### Conceptual variation; different ways to ask children to solve $21 + 34$



?	
21	34

Word problems:

In year 3, there are 21 children and in year 4, there are 34 children. How many children in total?

$21 + 34 = 55$ . Prove it

21

+34

—

$21 + 34 =$

   $= 21 + 34$

Calculate the sum of twenty-one and thirty-four.



Missing digit problems:

10s	1s
	?
?	5



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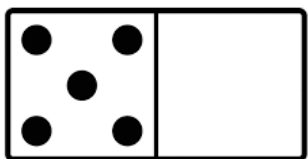
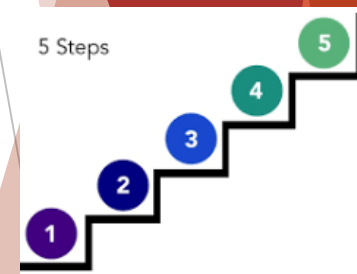
## Mastery in Reception



# Number of the Week

Show me 5.  
Show me 5  
in another  
way?

5



How do you know they  
are the same number?  
What is the same or  
different about these 5's?



# Becoming the Master of 5!

## Counting:

- Count everything once.
- Say the numbers in the correct order.
- You can count any collection of objects whether real or imaginary.
- It doesn't matter what order you count

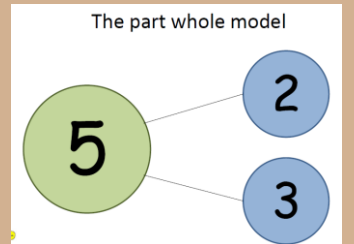
## Cardinality:

- The last number you say is how many there are

## The 5 C's

## Composition -

- Seeing numbers in numbers!



## Conservation:

- However you move the objects the number doesn't change.

## Subitising:

- Recognising 5 in structured and unstructured ways.

## Comparison -

- Who has the most / fewest?
- How many apples are in the fruit bowl, or how many do you think will fit in the bowl?

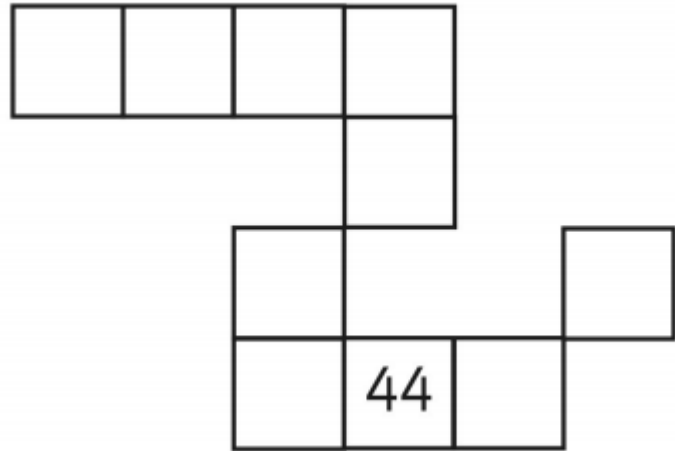




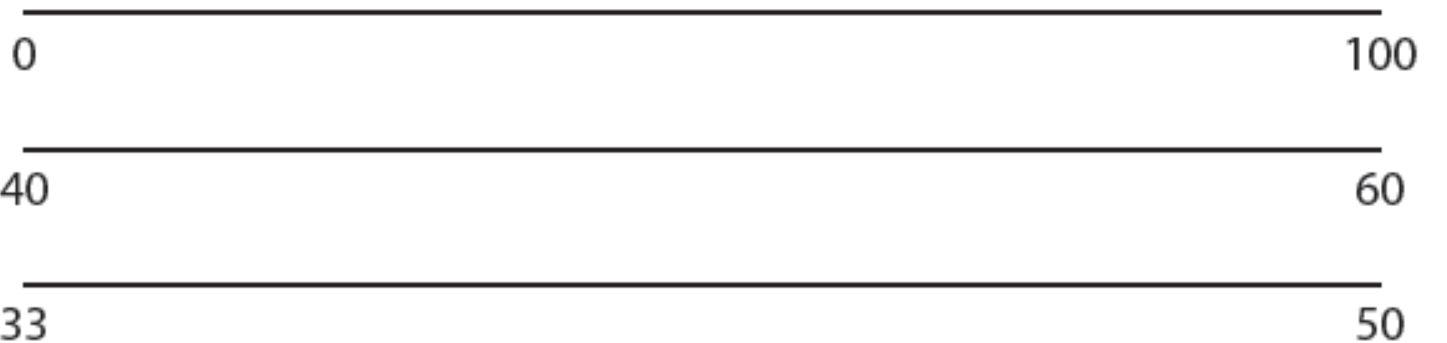
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## Mastery in years 1 and 2



Place 47 on each of these empty number lines.





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Fill in the missing numbers. What do you notice?

27	
15	?

12	15
?	

37	
15	?

23	14
?	

13	14
?	

57	
15	?





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## Mastery in years 3 and 4

We learn to solve problems in Maths so that we can become better problem solvers in all aspects of life

What is this?

7

A starter activity - to show understanding of what numerals are and what they can represent

We learn to solve problems in Maths so that we can become better problem solvers in all aspects of life

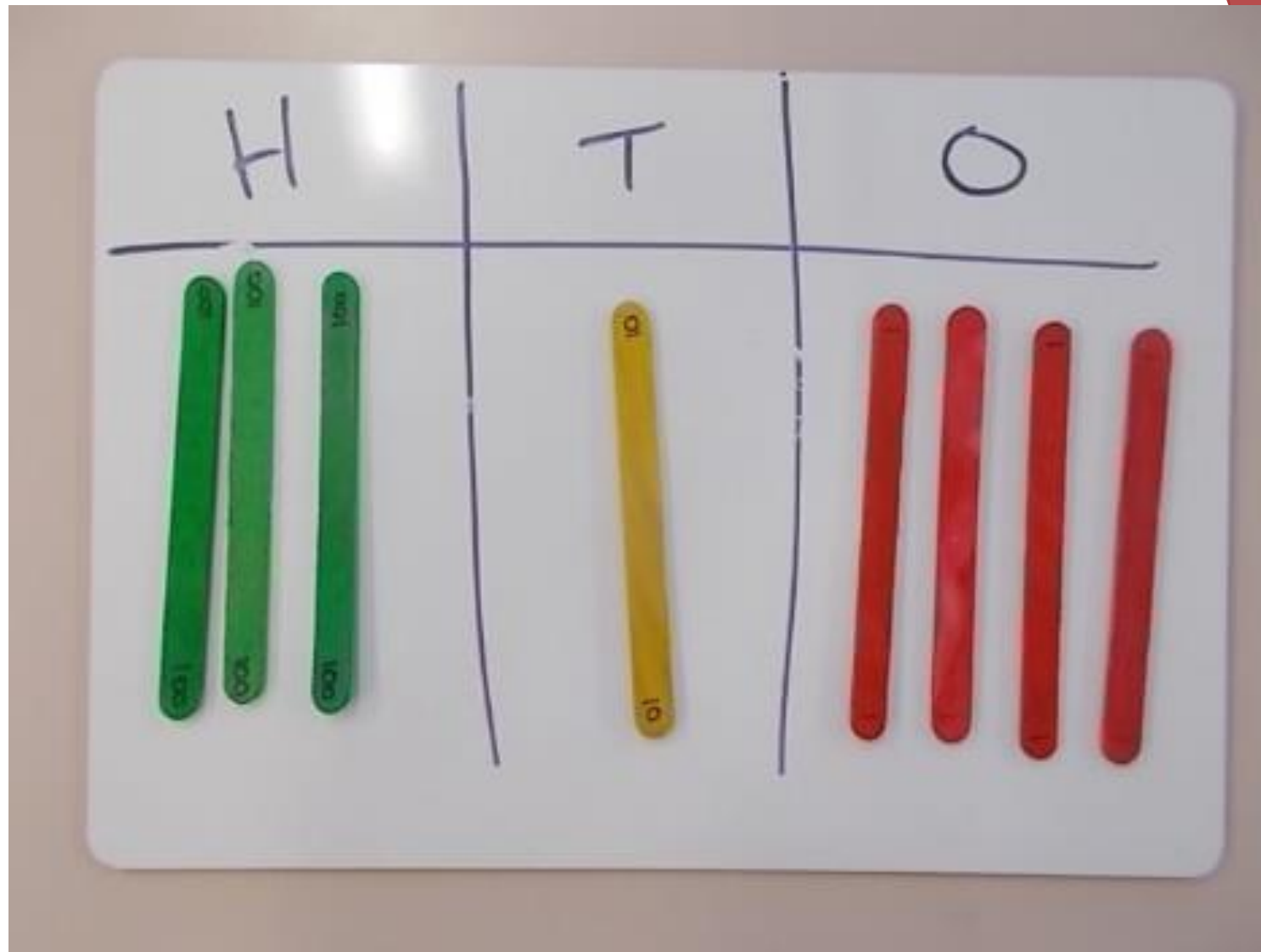
What is this?

13

A starter activity - then progression to introduce the concept of place value and 'explode' through partitioning

Hundreds	Tens	Ones

We introduce columns to as a base for our representations



Representations - we manipulate using concrete resources

H	T	O
○○○	○	○○○○

Representations - we represent pictorially

H	T	O
○○○	○	○○○○
300 +	10 +	4

Representations - we rebuild the number using numerals

③

Thousands				Hundreds				Tens		Ones	
○	○	○	○	○	○	○	○	○	○	○	○
				○	○						

$$4000 + 600 + 20 + 2 = 4622$$

four thousand + six hundred + twenty + two = four thousand, six hundred and twenty two. ✓

Representations - we rebuild the number using numerals





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## Mastery in years 5 and 6

Harriet has made five numbers, using the digits 1, 2, 3 and 4

She has changed each number into a letter.

Her numbers are:

- 1) aabdc
- 2) acdbc
- 3) dcaba
- 4) cdadc
- 5) bdaab

Here are three clues to work out her numbers:

- Number 1 is the greatest number.
- The digits in number 4 total 12
- Number 3 is the smallest number.



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## Questioning

Why?

What happens if....?

How do you know?

Will that always happen?

Can you prove it to me?

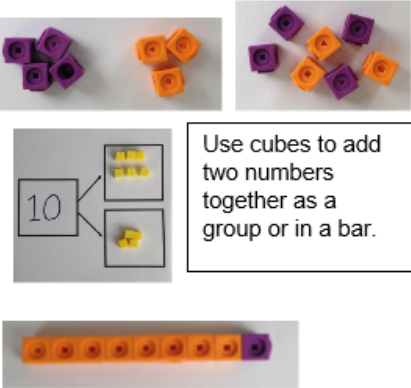
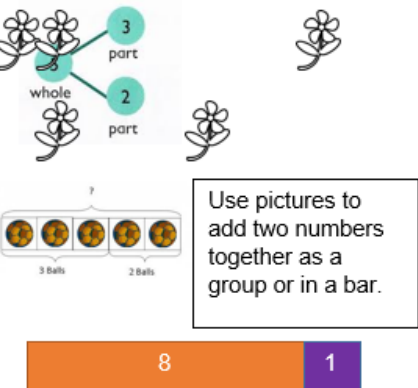


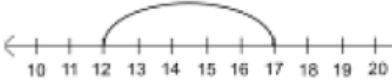


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## Progression in Calculations

### Addition

Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	 <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	$4 + 3 = 7$ $10 = 6 + 4$  <p>Use the part-part whole diagram as shown above to move into the abstract.</p>
Starting at the bigger number and counting on	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	$12 + 5 = 17$  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	$5 + 12 = 17$ <p>Place the larger number in your head and count on the smaller number to find your answer.</p>



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## Calculation progression examples



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## Mental strategies

- Partitioning
- Near doubles
- Bridging through 10
- Near a multiple of 10
- Near 10 e.g adding 9 or 11
- Using multiples
- Inverse



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## Questions and time to explore resources

But first, please fill out our evaluation!

Thank you very much for coming