

# Barnes Farm Infant School

KS1 Maths Workshop June 2017

## Our aims for this session are:

- ▶ To share some of key features of the National Curriculum for Mathematics.
- ▶ To share with you some of the ways that we teach your children to master mathematical skills.
- ▶ To provide ideas on how you can support your child at home. Including maths homework games and Challenge Me.

# Key Stage 1 - Years 1 and 2

- ▶ The principal focus of mathematics teaching in key stage 1 is to ensure that pupils **develop confidence and mental fluency** with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources [for example, concrete objects and measuring tools].
- ▶ At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- ▶ By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.
- ▶ Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

# National Curriculum Headings

Number	Measurement	Geometry	Statistics
Place Value	Time	Properties of shape	Graphs
Addition and subtraction	Money	Position and direction.	Data
Multiplication and division	Length		
Fraction	Weight and capacity		

# PROGRESSION – NUMBER & PLACE VALUE

## Year 1

- ⌘ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- ⌘ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
- ⌘ read and write numbers from 1 to 20 in numerals and words.
- ⌘ read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- ⌘ recognise, find and name a half & a quarter as one of two equal parts or 1 of 4 equal parts of an object, shape or quantity

## Year 2

- ⌘ count in steps of 2, 3, and 5 from 0, and in tens from any number forward or backward
- ⌘ compare and order numbers from 0 up to 100; use  $<$ ,  $>$  and  $=$  signs
- ⌘ identify, represent and estimate numbers using different representations, including the number line
- ⌘ recognise the place value of each digit in a two-digit number (tens, ones)
- ⌘ use place value and number facts to solve problems

# PROGRESSION – ADDITION & SUBTRACTION

## Year 1

- ⌘ read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
- ⌘ represent and use number bonds and related subtraction facts within 20
- ⌘ add and subtract one-digit and two-digit numbers to 20, including zero
- ⌘ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as  $7 = ? - 9$

## Year 2

- ⌘ using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- ⌘ applying their increasing knowledge of mental and written methods
- ⌘ recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- ⌘ add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers
- ⌘ show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- ⌘ recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

# PROGRESSION – MULTIPLICATION & DIVISION

## Year 1

- ⌘ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

## Year 2

- ⌘ recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- ⌘ calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals ( $=$ ) signs
- ⌘ show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- ⌘ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.



# PROGRESSION – FRACTIONS

## Year 1

- ⌘ recognise, find and name a half as one of two equal parts of an object, shape or quantity
- ⌘ recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

## Year 2

- ⌘ recognise, find, name and write fractions  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{2}{4}$ ,  $\frac{3}{4}$  of a length, shape, set of objects or quantity
- ⌘ write simple fractions for example,  $\frac{1}{2}$  of 6 = 3 and recognise the equivalence of  $\frac{2}{4}$  and half



# Maths at Barnes Farm Infants

- ▶ Maths happens daily in some form
- ▶ Sometimes lessons are purely practical, sometimes recorded on whiteboards and then progressing to Maths books.
- ▶ Maths happens both in the classroom and in the outside environment.
- ▶ Daily 'Get Solving' - mental maths session.
- ▶ Cross curricula links with other subjects - science, P.E, history, geography, Computing...
- ▶ Handwriting and spelling includes maths words and numbers.

# Warm Up!

- ▶ How many number sentences can you make using only these 3 digits:

3

8

7

- ▶ E.g.  $38 + 7 =$

# Get Solving - Daily mental maths

- How many different addition number sentences can you write where the answer is:

10

► Did anyone have...

$$10 = 5+5$$

$$6+4 = 7+3$$

## Children need:

- ▶ To be taught the specific skills needed in calculation (four operations)
- ▶ To understand what they are doing and why.
- ▶ To enjoy maths
- ▶ To leave school with solid mathematical foundations in order to help them in adult life.

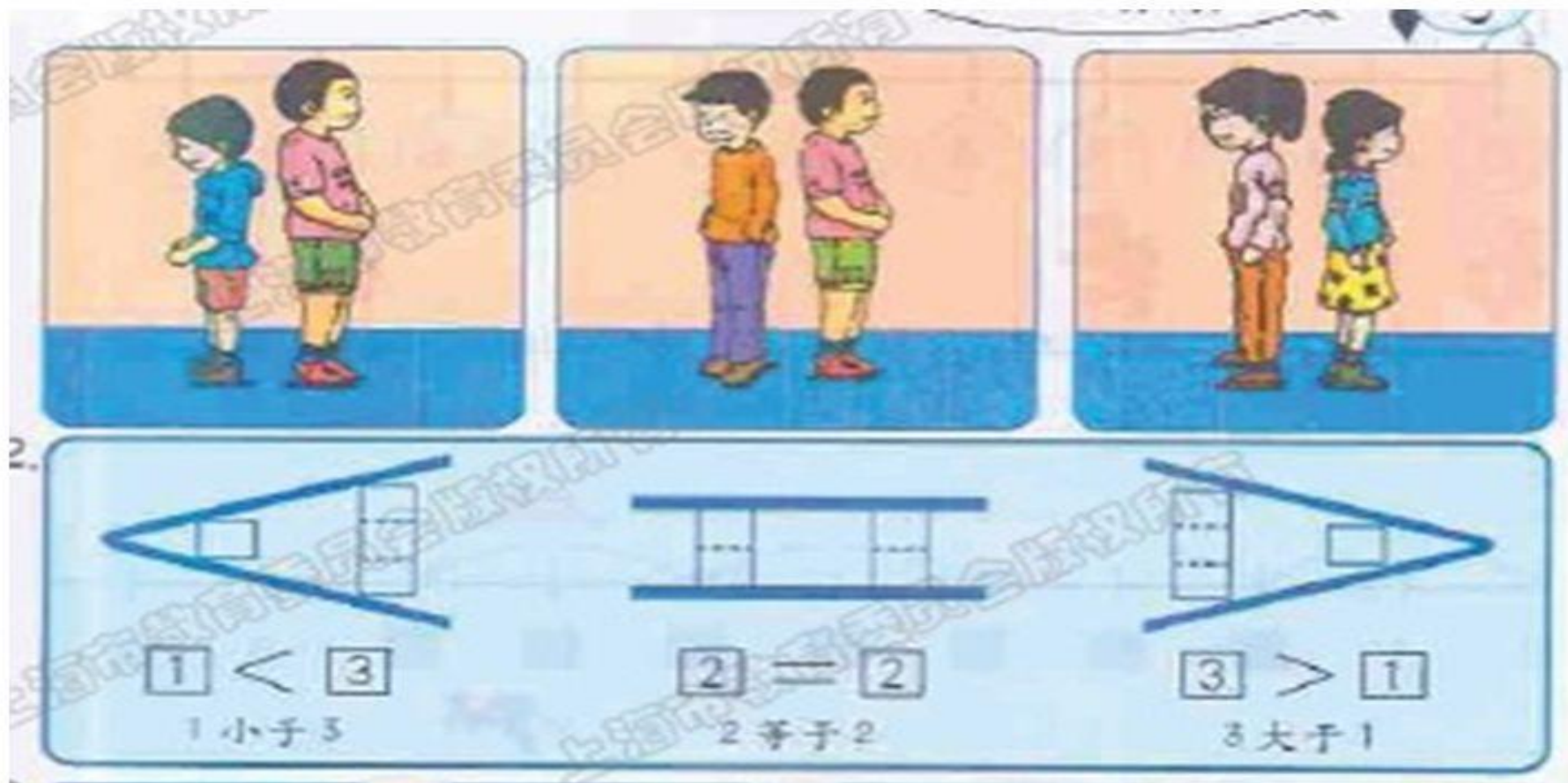
# Number

- ▶ Number is a large part of the Maths Curriculum.
- ▶ When children are secure in number this help them become more fluent in the other areas of mathematics.
- ▶ Children attempting to use formal written methods without a secure understanding will try to remember rules, which may result in unnecessary and mistaken applications of a standard method.

$$\begin{array}{r} 24 \\ +39 \\ \hline 513 \end{array}$$



# Drawing attention to structure in KS1





# Place Value

- ▶ What does this say? 3
- ▶ Are you sure?
- ▶ What if I put a 0 after it? 30
- ▶ What if I put a 12 after it? 312
  
- ▶ This is a big thing for children to understand.
  
- ▶ Also understanding how to write the bigger numbers:  
123 not 100203

# Place Value

146

How do you know the value of this number?

Saying it out loud

One Hundred and Forty Six - gives you a clue

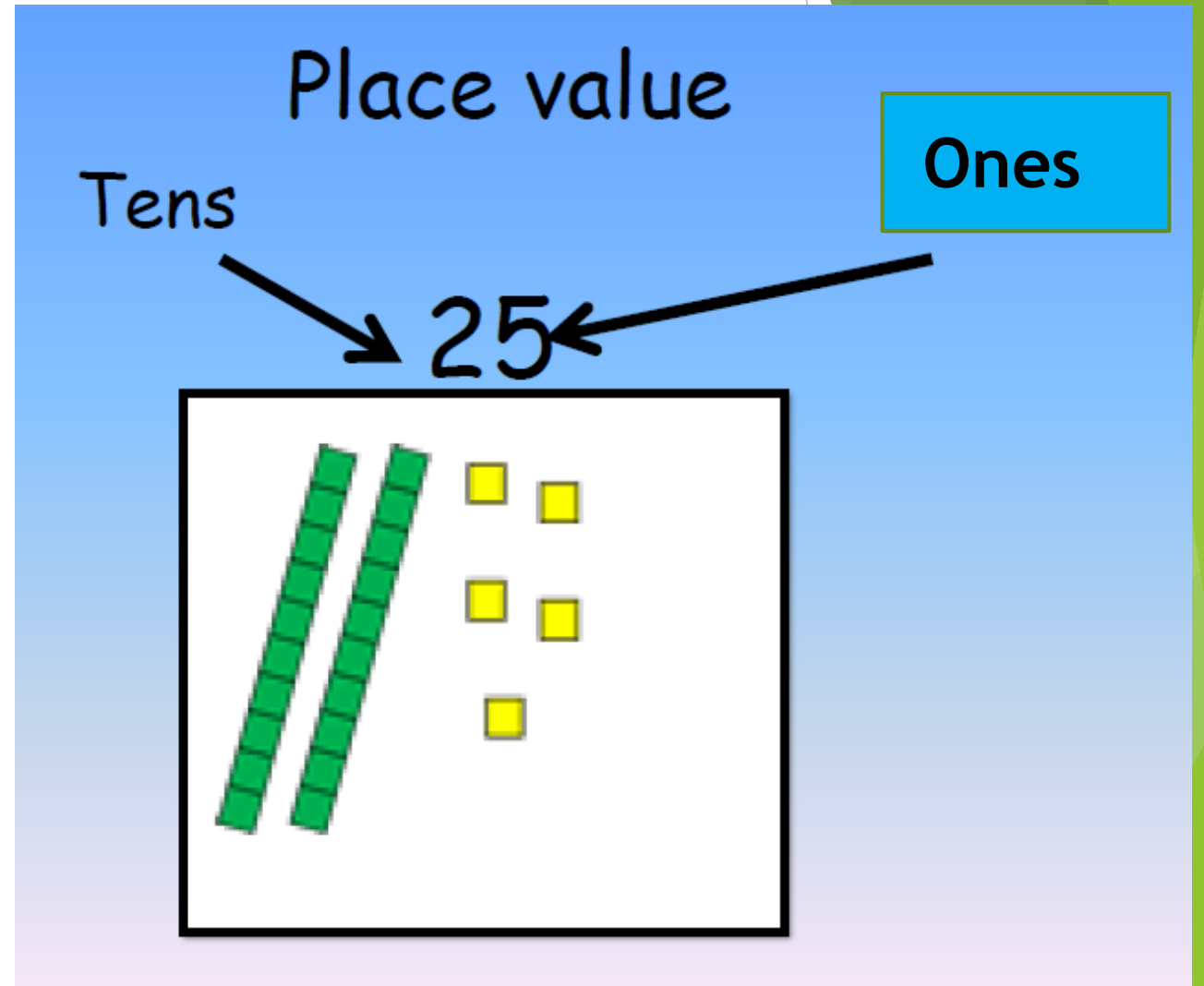
H	T	O
1	4	6

Each digit has a place

Each place has a value

Place value is of fundamental importance to children's understanding of maths and without a solid grasp of it, children will find it very difficult to move on.

Children who are secure in number are more likely to be secure in other areas of maths.



# Partitioning

This just means chopping a number into tens and ones.

E.g.

$$23 = 20 + 3$$

$$111 = 100 + 10 + 1$$

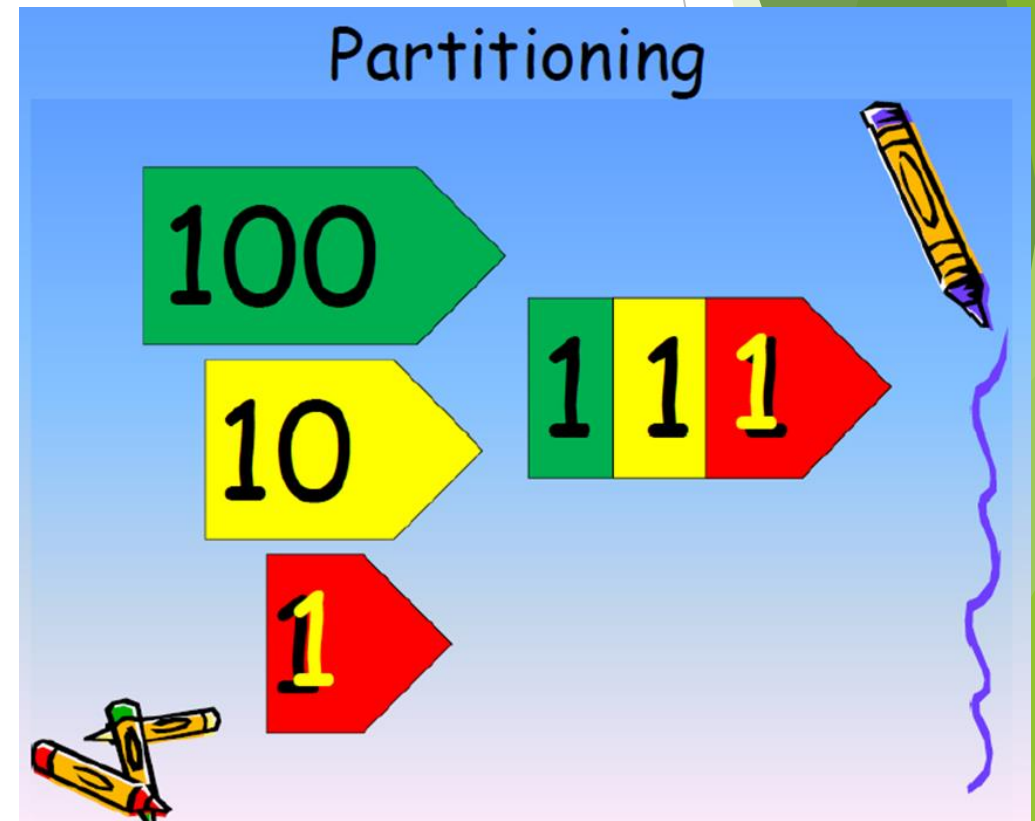
This knowledge can then be used to add 2 numbers

$$24 + 25$$

$$20 + 4$$

$$20 + 5$$

$$40 + 9 = 49$$



# The amazing, marvellous 100 square!

- ▶ There are so many ways to use it!
- ▶ Number recognition - put your finger on 36.
- ▶ Addition by counting on.
- ▶ Subtraction by taking away.
- ▶ Adding and subtracting multiples of 10.

	35		37
		46	
	55		
64		66	

	62		
	72		
		83	84
		93	

			15
22			25
	33		
		44	45

# 100 square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Adding 10 go down 1 ↓

Subtracting 10 go up 1 ↑

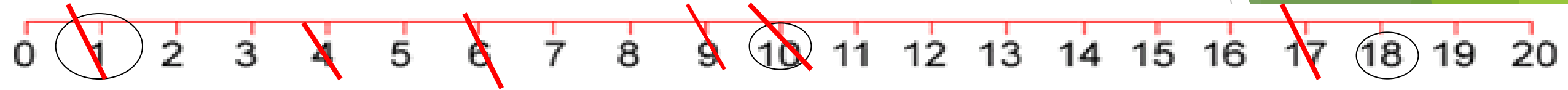
Adding 1 go right 1 →

Subtracting 1 go left 1 ←

Odd and even numbers

Counting in amounts -  
2s, 5s, 10s

# Strike It Out



$$6 + 4 = 10$$

10 take away 9 makes 1

1 add 17 is 18

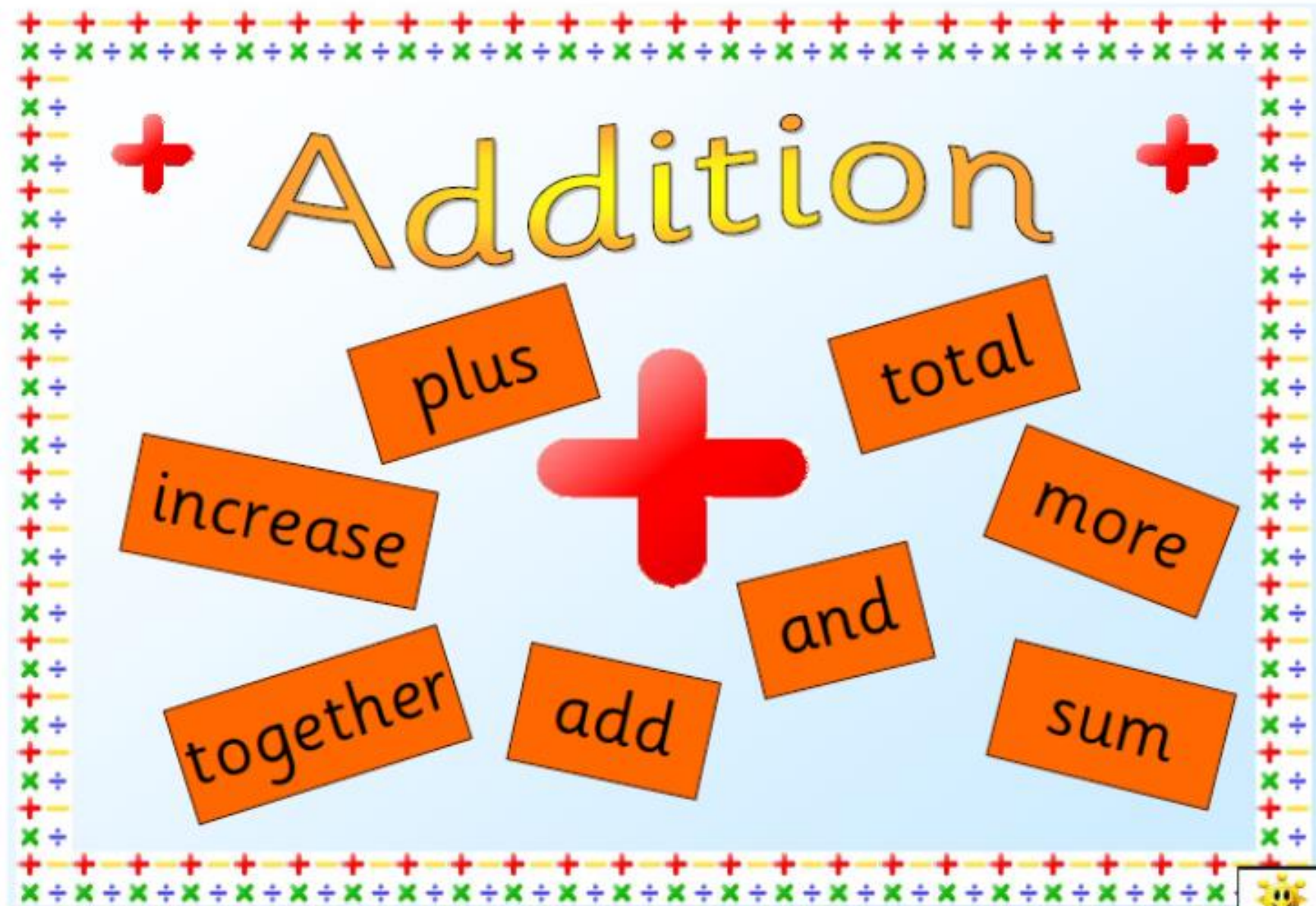
18.....

Competitive aim – stop your partner from going

Collaborative aim – cross off as many as possible



# VOCABULARY



# Addition

- ▶ Use practical equipment to total the 2 amounts.
- ▶ Put the biggest number first.
- ▶ Use a number line/ruler to help them add by counting on.
- ▶ Mental Skills - Put the bigger number first and count on.
- ▶ Partitioning
- ▶ Column addition

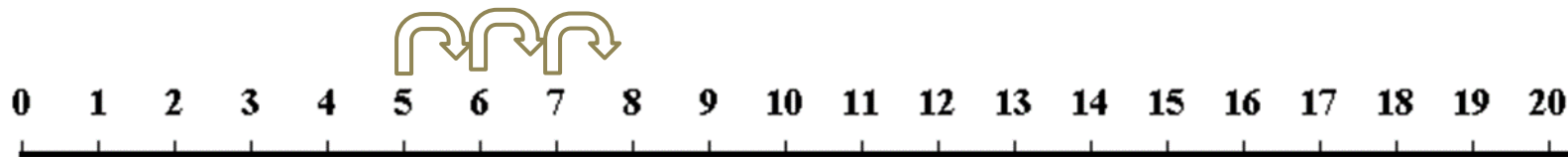
## Using practical equipment

$$4 + 6 =$$



Adding  $5 + 3 = 8$

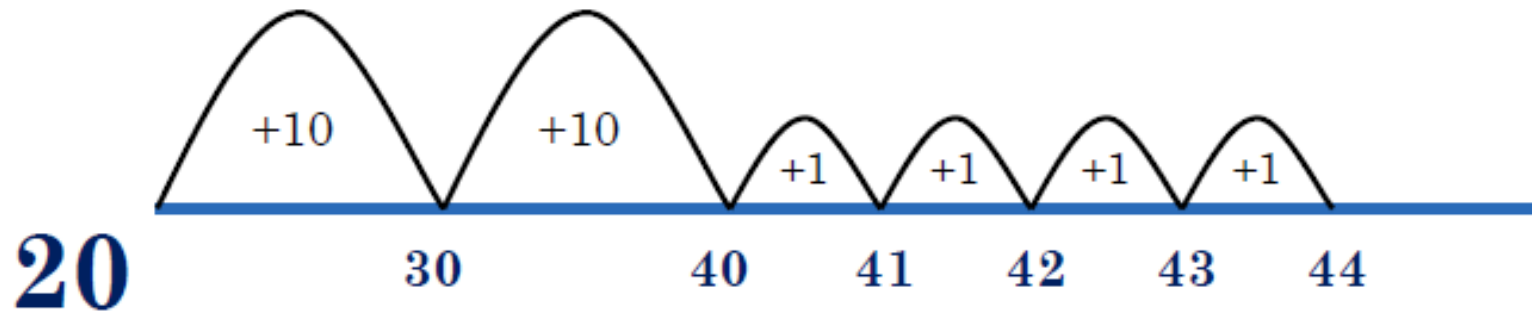
Step 1 start on the biggest number and count on in jumps.



# Adding on a number line & Counting on!

What does this number sentence look like on a number line?

$$20 + 24 =$$

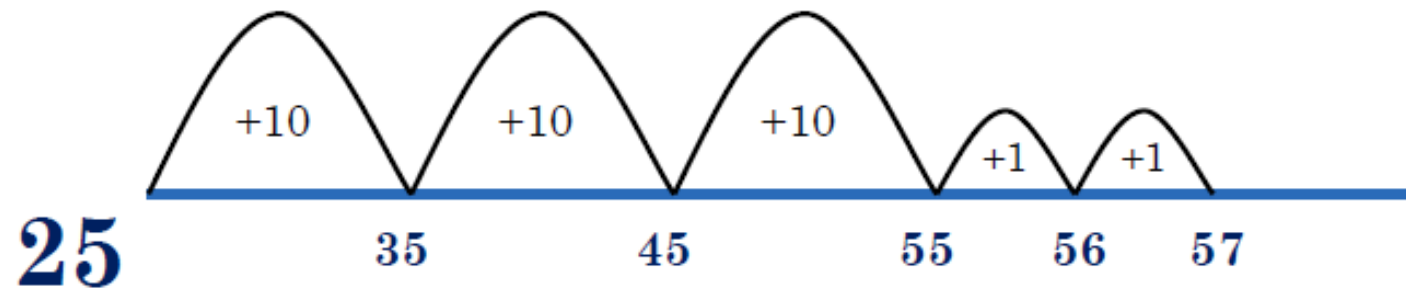


# Your Turn!

$$25 + 32 =$$

Now Show me on your whiteboards!

This is what it should look like:





# VOCABULARY

## - Subtraction -

fewer

difference between

minus

decrease

take from

reduce

take away



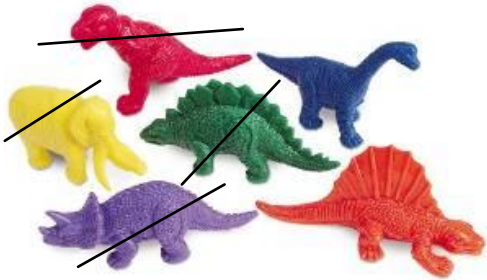
# Subtraction

- ▶ Use practical equipment to physically remove the number.
- ▶ Put the biggest number first.
- ▶ Use a number line/ruler to help them add by counting back.
- ▶ Mental Skills - Put the bigger number first and count back.
- ▶ Partitioning
- ▶ Inverse - by counting on to find the difference.
- ▶ Column subtraction



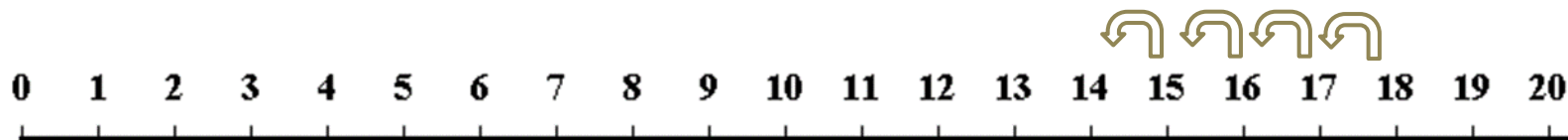
## Using practical equipment

$$6 - 4 =$$



Subtracting  $18 - 4 =$

Start on the biggest number and count back in jumps.



## SUBTRACTING ON A NUMBER LINE

Number sentence:

$$46 - 15 =$$



# Multiplication - Groups of

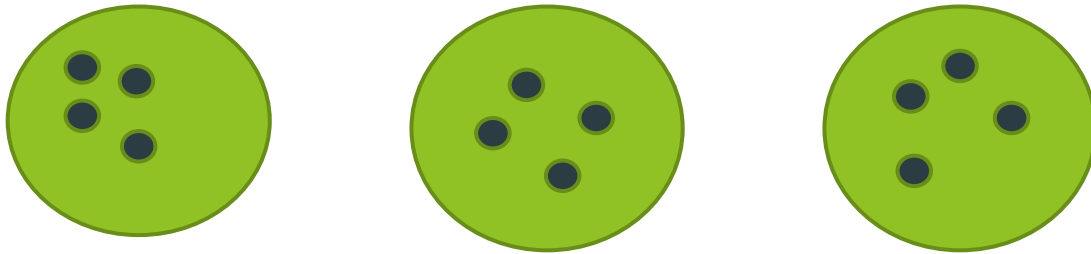
- ▶ Children are already familiar with counting in 2's, 5's and 10's.
- ▶ Make sets and then count the sets.
- ▶ Repeated addition.
- ▶ Arrays
- ▶ Recognise that  $2 \times 4 =$  is the same as  $4 \times 2 =$

Multiplication represented as an array. How many different ways could we represent 12?



# Dividing

- ▶ Sharing into a given number of groups - 12 shared between 3 gives 4 each.



- ▶ Splitting into groups of a given number.

# Linked to this is Fractions

- ▶ To recognise that  $\frac{1}{4}$  means 1 out of 4 parts.
- ▶ Importance of parts being equal.
- ▶ Fractions of shape, number, length.
- ▶ Equivalent fractions -  $\frac{1}{2} = \frac{2}{4}$

# Problem Solving - Worded Problems

- It is important to encourage children to look first at the problem and then get them to decide which is the best method to choose - pictures, mental calculation with or without jottings or structured recording.



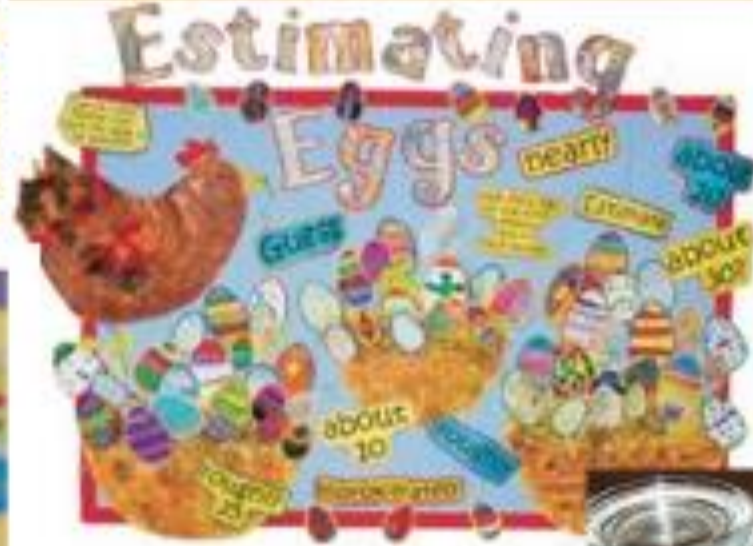
# Bar Modelling

- ▶ Identify the unknown. Children to identify what they need to work out.
- ▶ Read the problem
- ▶ Write sentence for the answer leaving gap (unknown)
- ▶ Think about what is being asked.
- ▶ Draw the bars.
- ▶ Partition or chunk the bars.

Sophie has 7 sweets. Finley has 5 sweets. How many do they have altogether?

Sophie	Finley
?	

The model does not give the children an answer but it clearly shows them what they are working out.



# MATHS AT HOME!



- Counting game (snakes and ladders, any dice games)
- Recognising numbers when out and about (house numbers, car number plates)
- Using money (buying things from the shops, finding out the change)
- Counting when out and about (counting cars, steps, items at the supermarket)
- Recognising shapes (buildings, windows, nature)
- Helping in the kitchen (weighing out ingredients, time, counting out amounts of food)

