



ST. JOHN'S
CHURCH OF ENGLAND
INFANT SCHOOL

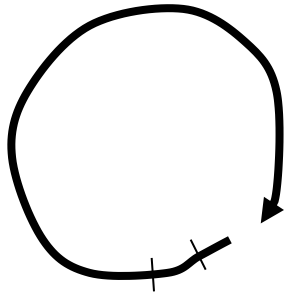
Mathematics

Progression in calculation

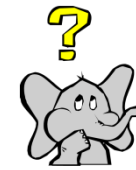
All children will develop efficient methods of calculation with all four operations choosing an appropriate method (mental, mental with jottings, written, calculator) to solve a range of different problems.

Children develop at different rates. It is important that they develop a mathematical understanding, a feel for number, NOT just learn a mechanical method that is prone to error.

Did you know that if you bend a number line around it could make the face of a clock or the dial on a pair of scales?



The Basics



three 3

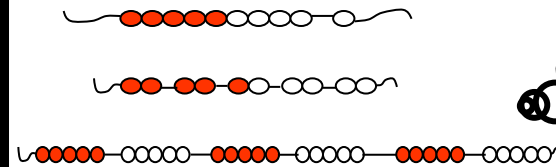
Recognise, read and write numbers

Know what numbers mean. Understand place value

1 ten 3 ones



13 thirteen

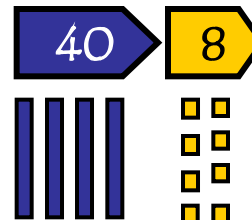


Count on and back in steps of the same size



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

Put numbers in order



Partition a number and recombine it

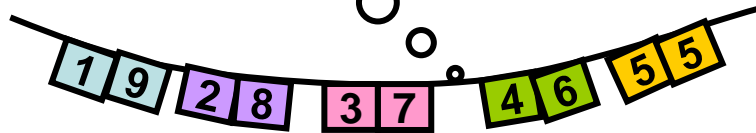
Addition



HEADS first!
Estimate.
Don't move
on until you
understand.

Go back if
you need to.

Know your number
bonds.
Pairs of numbers that
make 10 or 20



Number Bonds

$1 + 9 = 10$

$9 + 1 = 10$

$2 + 8 = 10$

$8 + 2 = 10$

$3 + 7 = 10$

$7 + 3 = 10$

$4 + 6 = 10$

$6 + 4 = 10$

$5 + 5 = 10$


Know that addition is counting on
and that it can be done in any order

$1 + 2 = 3$



$2 + 1 = 3$



 $2 + 5 = 7$

2 count on 5

 $5 + 2 = 7$

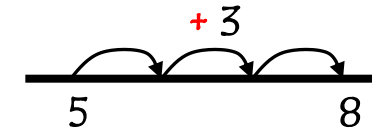
5 count on 2



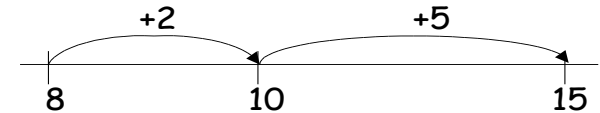
Add single digit numbers

- below 10
- then crossing over (bridging) 10

$3 + 5$



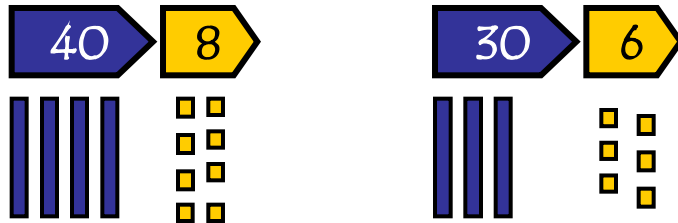
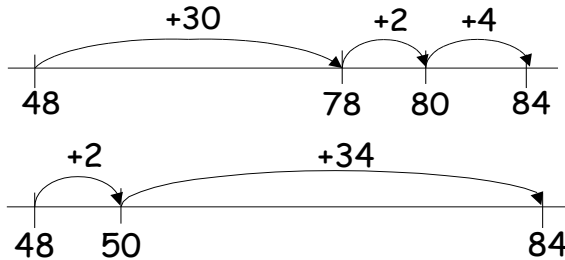
$8 + 7 = 15$



BIGGEST number first

Add two two-digit numbers
a) using a numberline

b) by partitioning & recombining



$$40 + 30 + 8 + 6$$

$$40 + 30 = 70$$

$$8 + 6 = 14$$

$$70 + 14 = 84$$

Expanded Method
(A stepping stone
to the column
method)

$$48 + 36$$

48

$$+ 36$$

T U

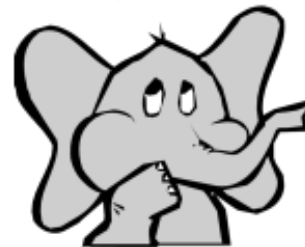
$$40 + 8$$

$$\underline{30 + 6}$$

$$80 + 4$$

10

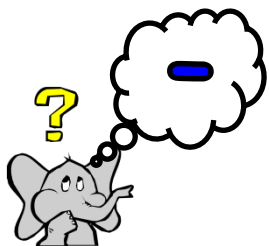
?



Children use their
knowledge of
addition facts to
inverse
calculations

$$25 + 2 = 27$$

$$27 - 5 = 2$$



Subtraction

HEADS first!
Estimate.
Don't move
on until you
understand.

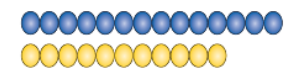
Go back if
you need to.

Know subtraction
facts for numbers
up to 10 and 20

Number Bonds

- $10 - 1 = 9$
- $10 - 9 = 1$
- $10 - 2 = 8$
- $10 - 8 = 2$
- $10 - 3 = 7$
- $10 - 7 = 3$
- $10 - 4 = 6$
- $10 - 6 = 4$
- $10 - 5 = 5$

Find the difference
between numbers

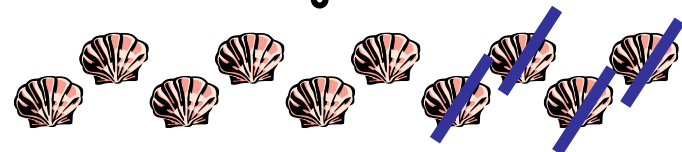


The difference
between 11
and 14 is 3.
 $14 - 11 = 3$
 $11 + \square = 14$

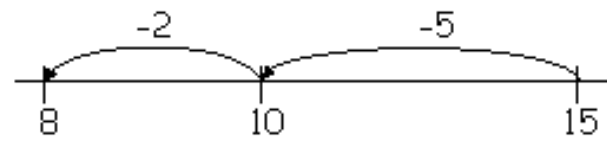
The difference is?



Subtract single digit numbers
• below 10
• then crossing through (bridging)



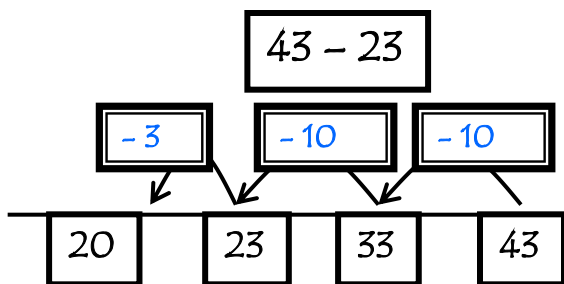
$$15 - 7 = 8$$



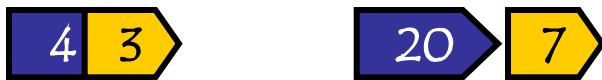
Biggest number FIRST

Subtracting two-digit numbers
a) taking away on a numberline

b) by partitioning the number to be taken away



$$43 - 27 = 16$$

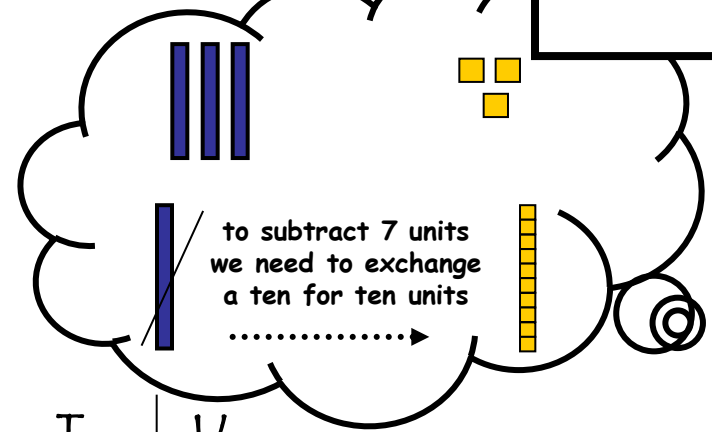


$$43 - 20 = 23$$

$$23 - 7 = 16$$

Expanded Method
(A stepping stone to the column method)

$$43 - 27 = 16$$



T	U
- 2	7

$$\begin{array}{r} 30 \quad \cancel{40} \quad + \quad 10 + 3 \\ - \quad 20 \quad + \quad 7 \\ \hline 10 \quad + \quad 6 \end{array}$$

There are two other inverse sums for these numbers.

Children use their knowledge of facts to inverse calculations.

$$39 - 3 = 36$$

$$36 + 3 = 39$$

HEADS first!

Estimate.
Don't move on until you understand.

Go back if you need to.



x

Multiplication

Do you know your times-tables to 10 x 10? Learn them they're really useful!

x 5

$2 \times 5 = 10$

$6 \times 5 = 30$

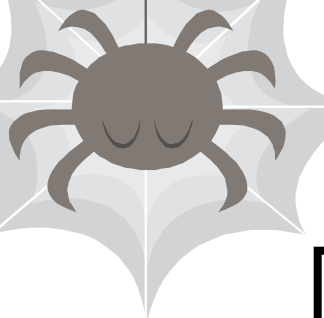
$4 \times 5 = 20$

$3 \times 5 = 15$

$10 \times 5 = 50$

$8 \times 5 = 40$

$5 \times 5 = 25$



$2 + 2 + 2 + 2 = 8$

$4 \times 2 = 8$

2 multiplied by 4

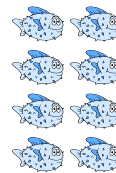
4 lots of 2

Know that multiplication is repeated addition

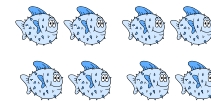


$2 + 2 + 2 + 2$

Set out multiplication as an array and show jumps on a number line



2×4

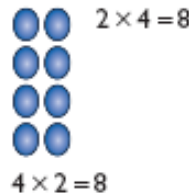


4×2



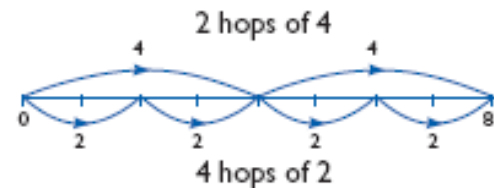
$4 \times 2 = 8$

$2 \times 4 = 8$

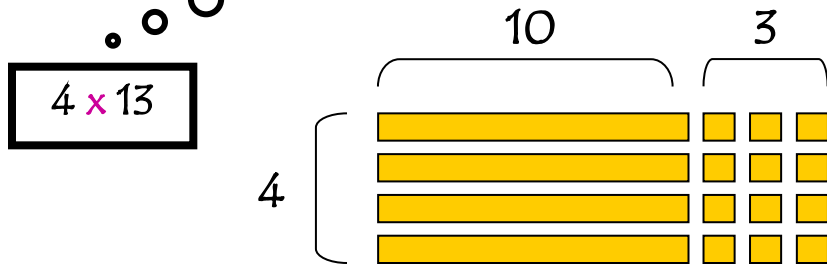


$2 \times 4 = 8$

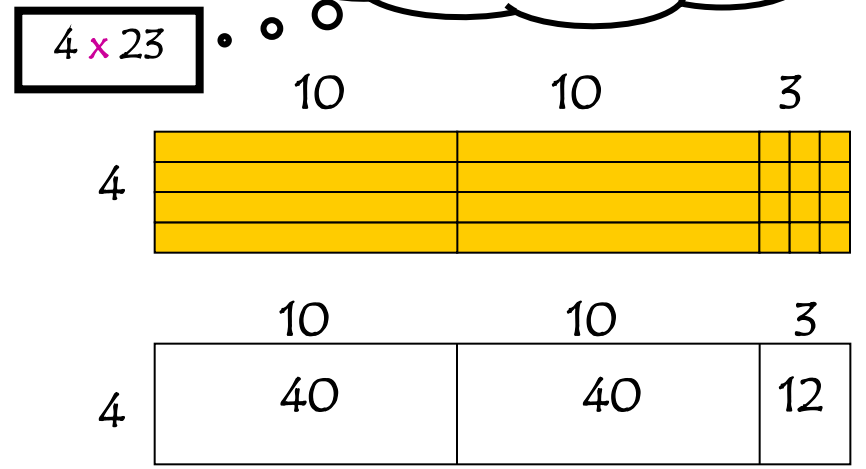
$4 \times 2 = 8$



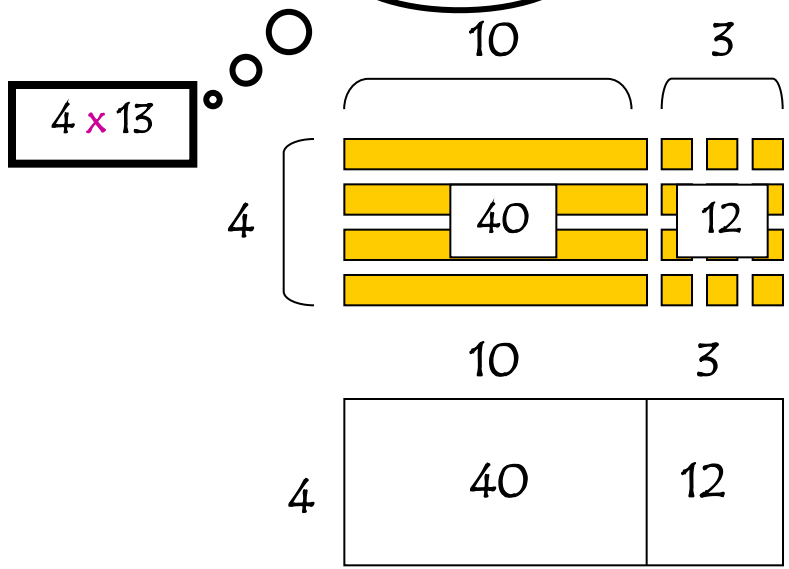
Use base 10 apparatus to support multiplication of $U \times TU$



Multiply $TU \times TU$ using the grid method



Use base 10 apparatus to support multiplication of $U \times TU$ alongside the grid method

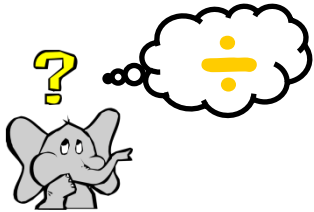


$80 + 12 = 92$

$40 + 12 = 52$

Practise with practical questions. There are 4 of us with 2 eyes each. How many eyes in total?





Division

HEADS first!
Estimate.
Don't move on until you understand.
Go back if you need to.

Do you know your division facts?
Learn them, they're really useful!

$$\div 5$$

$$10 \div 5 = 2$$

$$30 \div 5 = 6$$

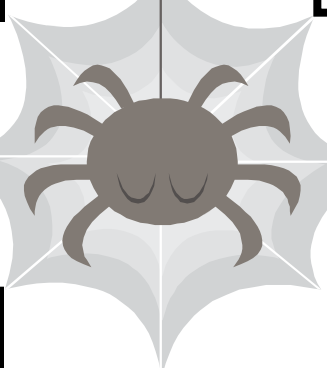
$$20 \div 5 = 4$$

$$15 \div 5 = 3$$

$$50 \div 5 = 10$$

$$40 \div 5 = 8$$

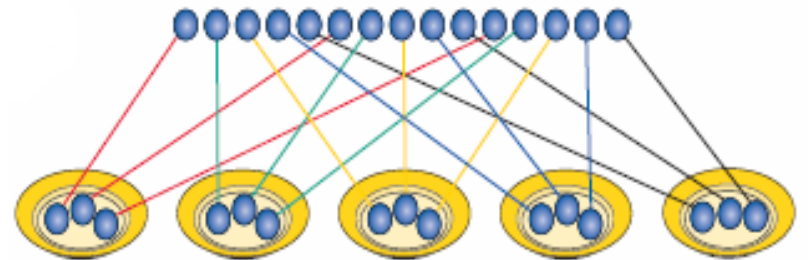
$$25 \div 5 = 5$$



Share things out equally,
then begin to understand remainders

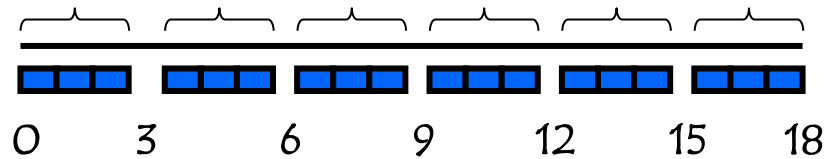
$$15 \div 5 = 3$$

15 shared between 5



Group objects to divide them and
show this on a number line

$$18 \text{ divided into groups of } 3$$
$$18 \div 3 = 6$$

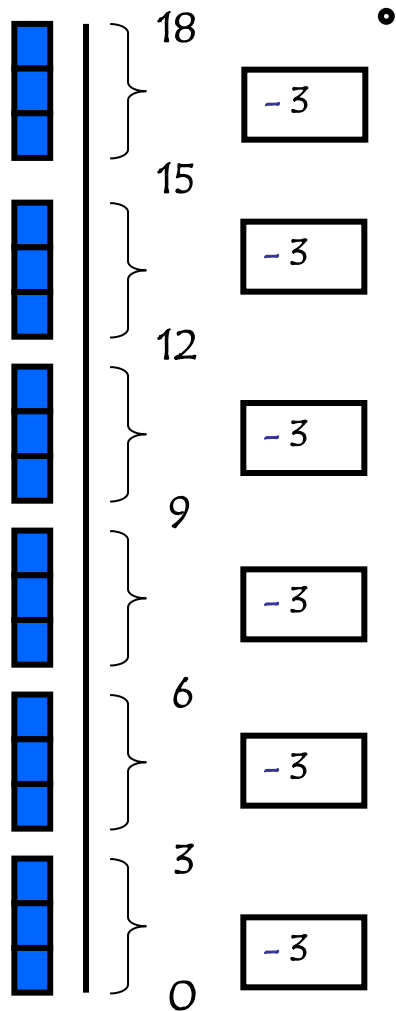


$$18 \div 3 = 6$$



$$18 \div 6 = 3$$

Understand division
as repeated
subtraction



Practical purposes for maths
really brings it to life.

For example, sharing food
between the number of plates.
How many plates? How many
are there on each plate?

