CALCULATING IN LOWER KS2

MATHEMATICS AT ST BOTOLPH'S

AIMS AND OBJECTIVES

- Consider the developmental stages of number and calculation.
- Explore how we teach counting and place value and analyse the resources we use.
- Understand the basic end of year expectations within the KS2 framework for mathematics.

- **To provide parents and carers with a clear guide as to which algorithms their children are being taught.**

NATIONAL CURRICULUM

Fluency: flexibility (making connections), speed and accuracy;
Problem solving (not just word problems); and
Reasoning (using mathematical language to clearly explain patterns, hypothesise or enquiries).

St Botolph's children learn to:

- Confidently and accurately **mentally calculate**, without reliance on formal written methods;
- Identify **when** to mentally calculate and when to use formal written methods;
- Identify which **reliable** method of calculating is the **most efficient**;
- Confidently and accurately **reason** in relation to their calculating;
- Confidently and accurately use a varied **vocabulary** when reasoning;
- Use their mental maths and understanding of number to acknowledge whether their answer is feasible.

THE IMPORTANCE OF GUIDED PROGRESSION

- There are lots of progressions for addition, subtraction, multiplication and division. All have advantages and disadvantages – pupils will quickly find their favourites.
- All children need time to consolidate their knowledge to ensure they understand the concepts that underpin the methods.
- The speed at which pupils move through the progressions is very individual.

Fact : it is important that children’s mental methods of calculation are practised and secured alongside their learning and use of efficient written methods for calculations.

Implications for parents and carers: if you want to support the learning and understanding of your children’s written methods, then helping them with mental calculations is imperative!

NATIONAL CURRICULUM

Year 3 Key Objectives- Mathematics

Number and place value

- count from 0 in multiples of 4, 8, 50 and 100
- find 10 or 100 more or less than a given number
- recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
- compare and order numbers up to 1000
- identify, represent and estimate numbers using different representations
- read and write numbers up to 1000 in numerals and in words
- solve number problems and practical problems involving these ideas.

Year 4 Key Objectives - Mathematics

Number and place value

- count in multiples of 6, 7, 9, 25 and 1000
- find 1000 more or less than a given number
- count backwards through zero to include negative numbers
- recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
- order and compare numbers beyond 1000
- identify, represent and estimate numbers using different representations
- round any number to the nearest 10, 100 or 1000
- solve number and practical problems that involve all of the above and with increasingly large positive numbers
- read Roman numerals to 100 (I to C)
- know that over time, the numeral system changed to include the concept of zero and place value.

NATIONAL CURRICULUM

Calculation

- add and subtract numbers mentally, including:
  - a three-digit number and ones
  - a three-digit number and tens
  - a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division,
- solve positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

NATIONAL CURRICULUM

Calculation

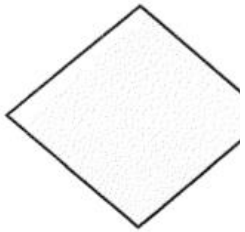
- add and subtract numbers with up to 4 digits
- using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts
- decide which operations and methods to use and why.

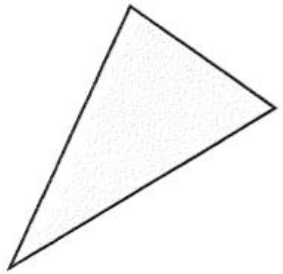
- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally
- multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- recognise and use factor pairs
- understand commutatively in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding,
- use the distributive law to multiply two digit numbers by one digit
- solve integer scaling problems
- solve harder correspondence problems such as n objects are connected to m objects.

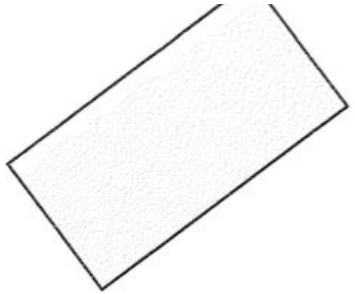
END OF KS1 EXPECTATIONS

6 Look at the shapes.

Tick (✓) the hexagon.







19 Amy buys an ice-cream for 90p.

(a) Tick (✓) **three** coins to show how Amy can make **90p**.

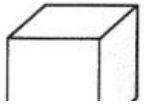
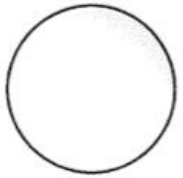
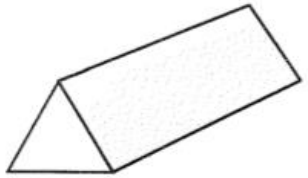
(b) Tick (✓) **four** coins to show anoth

8 Complete the table.

words	digits
thirty-eight	38
	40
ninety-four	

14 **One** shape is in the **wrong** place on the sorting grid.

Draw a cross (✗) on it.

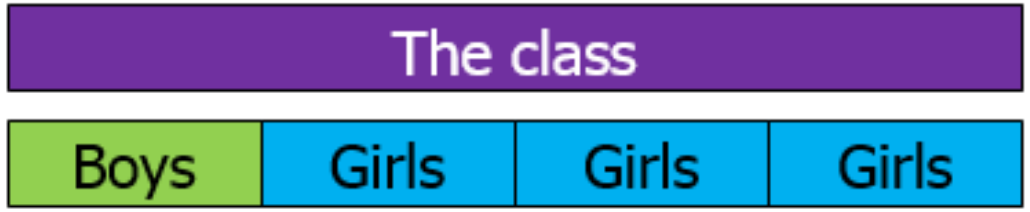
Shapes **with** a square face	Shapes **without** a square face
	 

END OF KS2 EXPECTATIONS

24 In a class, 18 of the children are girls.

A quarter of the children in the class are boys.

- The bar represents the whole class.

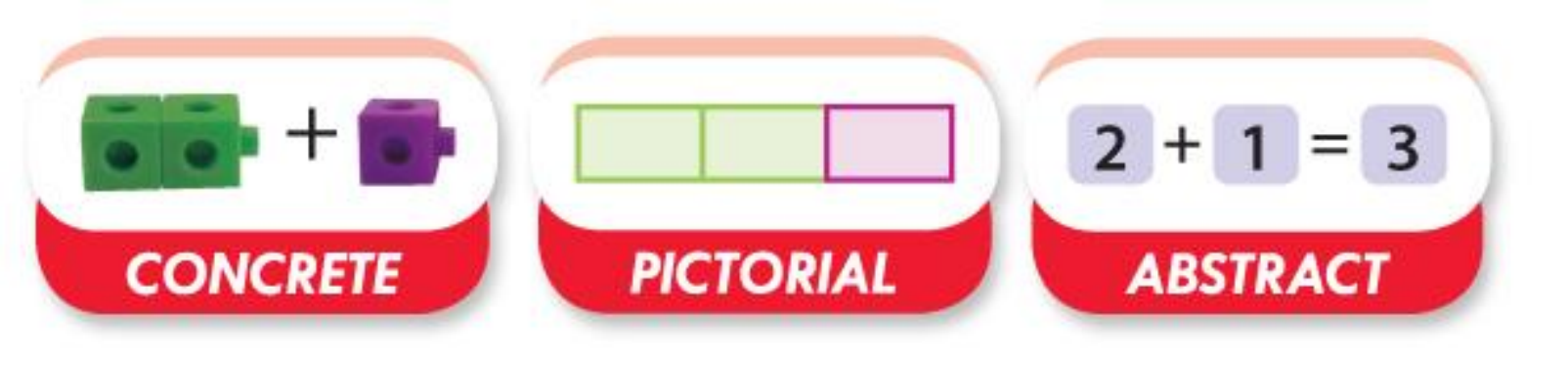


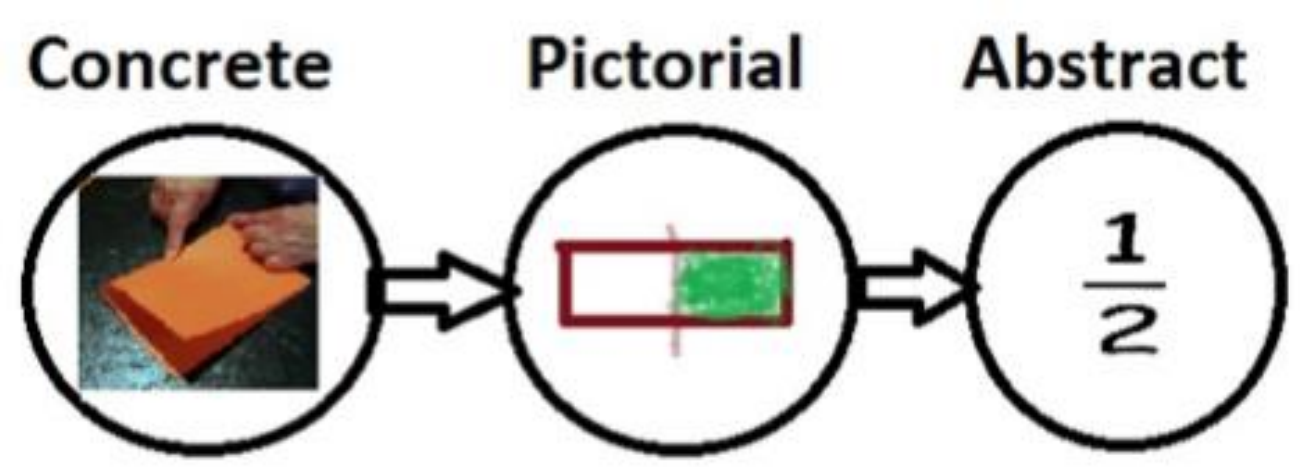
- The rest of the class must be girls

- As there are 18 girls, each of the three girls sections must equal 6.
- So the boys section must also be 6.
- $6 \times 4 = 24$, which means that 24 children are in the class.

SO HOW DO THEY GET THERE…

1. CONCRETE – PICTORIAL - ABSTRACT





2. VOCABULARY

Number and Place Value

- digit, ones, tens, hundreds
- place, place value, place holder
- more, less, many, few
- odd, even
- every other
- how man times
- pattern, pair, rule
- Sequence
- number , integer, roman numeral
- count, count up to
- count on (from, to)
- count back (from, to)
- count in
- count in multiples of 4, 8, 50, 100
- count in ones, twos, threes…

tens, hundreds

- zero, one, two… twenty (and beyond)
- zero, ten, twenty… one hundred
- zero, one hundred, two hundred…

stands for, represents
exchange, the same as
as many as
equal to
>greater, more, larger, bigger
<less, fewer, smaller
greatest, most, biggest, largest
least, fewest, smallest
one more, ten more, hundred more
one less, ten less, hundred less
compare, order, size, value
first, second, third… twentieth
twenty-first, twenty-second…
last, last but one
before, after, next
between, half-way between
above, below zero, minus
positive, negative

General

same, different
partition
commutative, distributive
equivalence
start from, start at
arrange, rearrange
split, separate
change
continue, carry on
what comes next
find, show me, choose, tell me
describe, solve, check, interpret
all, each, every
in order, in a different order
best way, another way
same way, different way

missing, different, same
explain you method
explain your answer
give an example of
investigate, identify

2. VOCABULARY

Calculation (Addition and Subtraction)

- + add, addition, more, plus, increase make, sum, total
- altogether, = equal to, the same as
- how many more make…
- how much more is…
- _ subtract, subtraction, take (away), minus
- leave, how many are left
- how many have gone
- how many fewer/less…
- difference between
- number bonds
- tens boundary, hundreds boundary
- exchange
- formal, informal
- columnar
- inverse operations
- one more, two more, ten more, one hundred more
- one less, two less, ten less, one hundred less

Calculations (Multiplication and Division)

lots of, groups of
multiplication/division facts
x times, multiply, multiplied by
multiple of, product
once, twice, three times…
ten times
repeated addition
array
row, column
doubling, double, near double
half, halve
share, share equally
one each, two each…
group in pairs, threes…
equal groups of
÷ divide, division, divided by, divided into
= equal to, sign, is the same as
remainder, factor
quotent, dividend, divisor

Calculations (Solving Problems)

pattern, puzzle
calculate, calculation, mental calculation
method, jotting, answer
right, correct, wrong, incorrect
what could we try next
how did you work it out
equation, sign, operation, symbol, predict
property, sort, classify, consecutive

Calculations (Estimating)

guess how many, estimate
nearly, roughly, close to
approximate, approximately
just over, just under
exactly, exact
too many, too few
enough, not enough
round (up or down), round to the nearest ten, hundred, thousand

3. 'MASTERY'

Mastery means that children are able to:

- use mathematical knowledge and understanding flexibly and fluently;
- recall key number facts with speed and accuracy;
- use accurate, rapid recall of number facts to be able to calculate unknown number facts efficiently;
- reason and explain mathematical concepts and use this reasoning to solve a variety of problems.

Examples of mastery:

- Can they describe their work in their own words, using mathematical vocabulary?
- Can they explain it to someone else, so that they too understand?
- Can they show their work in a variety of ways, i.e. using objects, pictures, symbols?
- Can they make up their own examples or questions using the concept that they have mastered?
- Can they see/make connections with other areas of mathematics, i.e. fractions and partitioning numbers?
- Can they recognise the same concept in a new situation or context, i.e. do they understand in any way it can be shown?
- Can they make use of their knowledge to work more efficiently, i.e. the quickest, easiest, most accurate way?

ADDITION AND SUBTRACTION

Written methods taught…

Year Two – Empty Number Lines and Partitioning

Year Three – Same as Year Two and Expanded Column

Year Four – Same as Year Three and Short Column (Expanded for Decimals)

… but there are many mental methods that support these.

NUMBER SENSE

Number sense

Number bonds

Known facts

Commutativity

Inverse

0 + 100 = 100
10 + 90 = 100
20 + 80 = 100
30 + 70 = 100
40 + 60 = 100
50 + 50 = 100

0 + 10 = 10
1 + 9 = 10
2 + 8 = 10
3 + 7 = 10
4 + 6 = 10
5 + 5 = 10

0 + 7 = 7
7 + 0 = 7
1 + 6 = 7
6 + 1 = 7
2 + 5 = 7
5 + 2 = 7
3 + 4 = 7
4 + 3 = 7

All ways to make a 1 digit or 2 digit number (known facts).

Year 3 and 4, continue to work with missing values and reverse equations, i.e. 42 = 5 + ? and 20 – 7 = or 100 - ? = 70

Year 3 and 4 continue to work on fact families and working systematically.

In Year 3 and 4, we partition numbers to use number bonds to calculate (make 10 strategy),

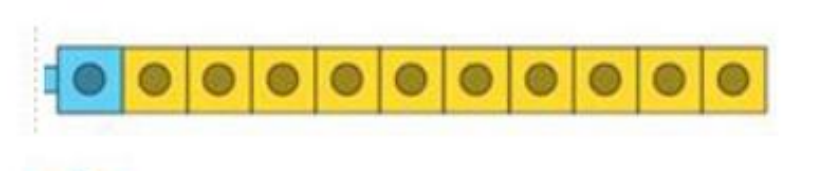
i.e. 45 + 26 =
45 + 5 (to number bond),
then + 1 +20 (or +10 +10)

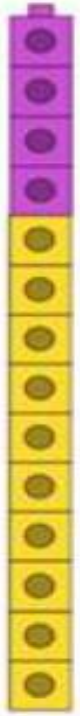
Near doubles...

27 + 28 = 27 x 2 + 1 = 20x2 + 7x2 + 1

Using known facts to derive known facts,
i.e. 'If I know 7 + 3 = 10, then I also know 70 + 30 = 100'.

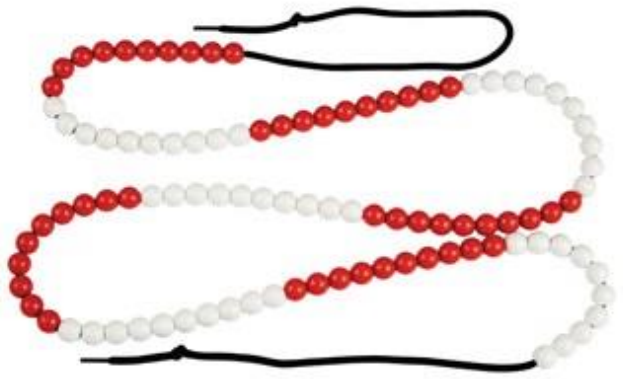
CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)





Cubes

Beadstring



To compare values and to calculate (include decimals in Year 4).

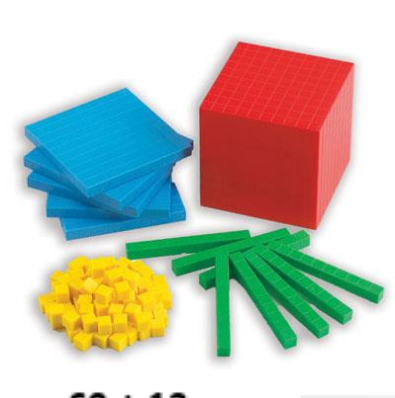
Using known facts to derive facts

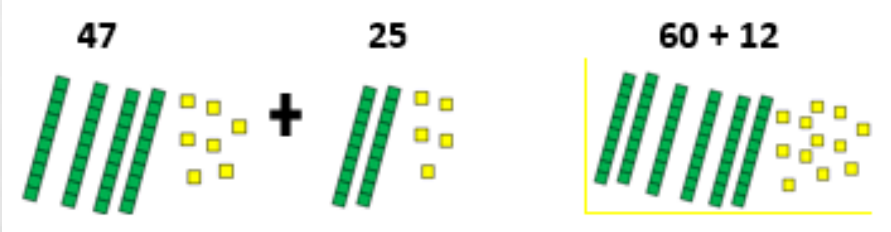
CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)

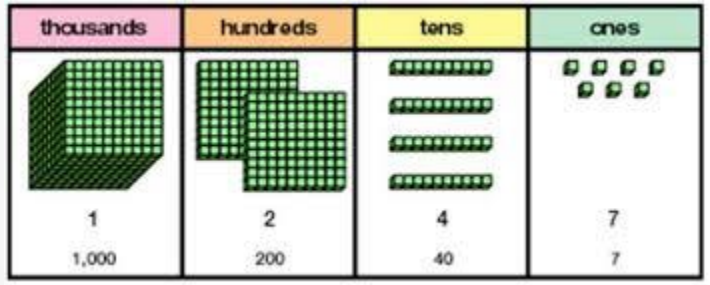
Dienes

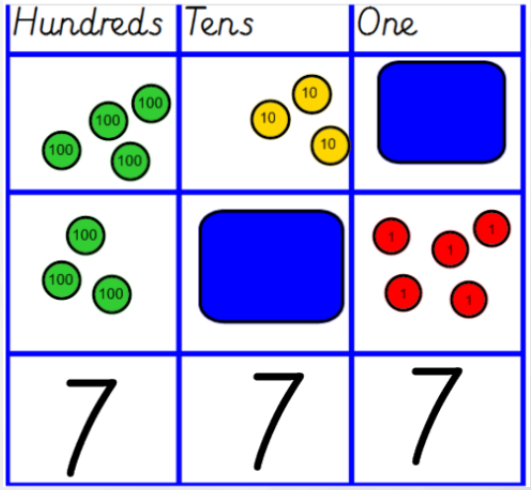
&

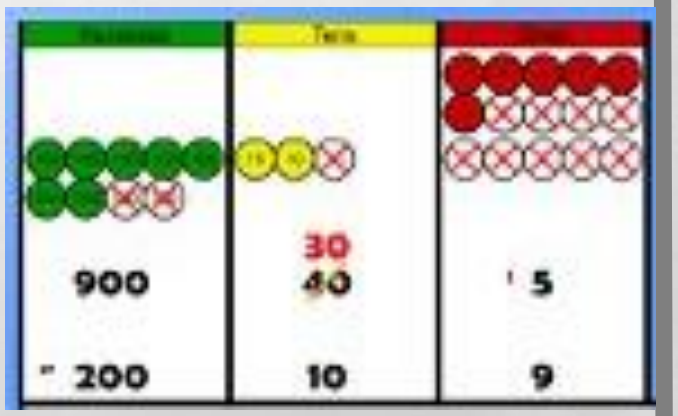
Place Value Counters











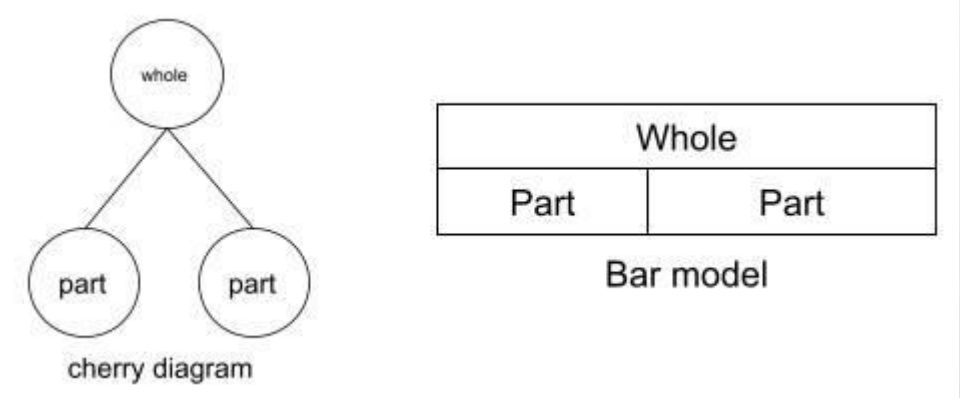
Year 3 and 4 use dienes and place value counters to regroup, calculate and problem solve,

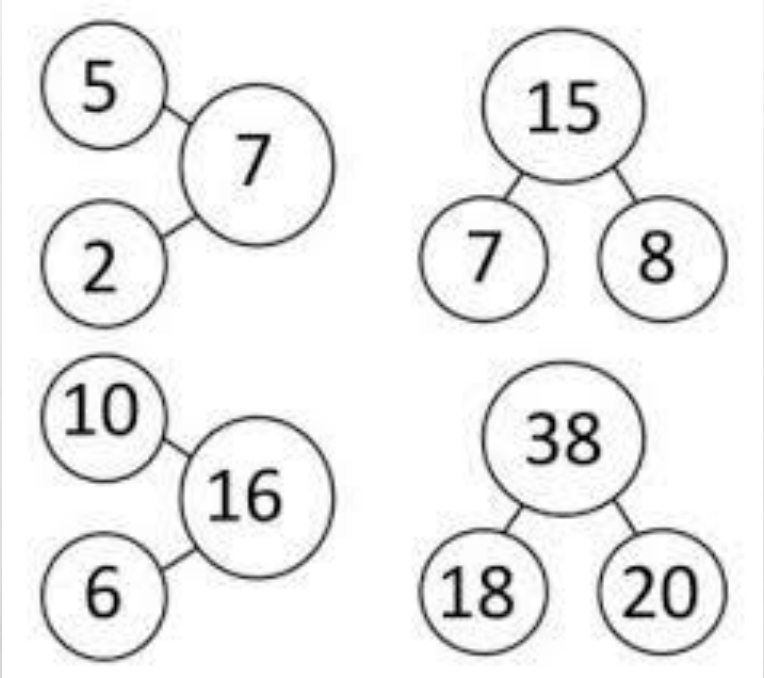
i.e. 254 = 200+50+4 = 100+150+4 = 102+151+1

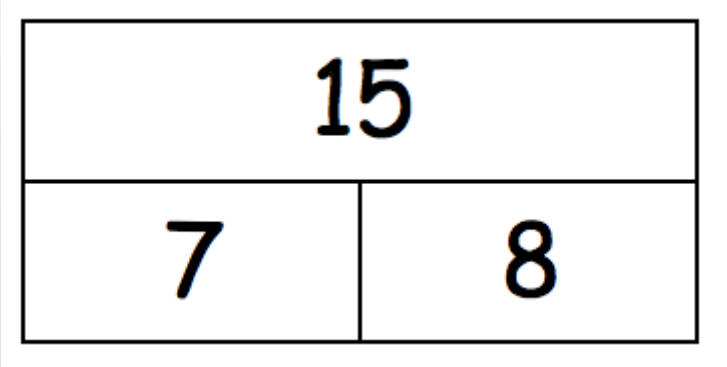
Year 3 work on numbers up to 1,000. Year 4 work with numbers beyond 1,000.

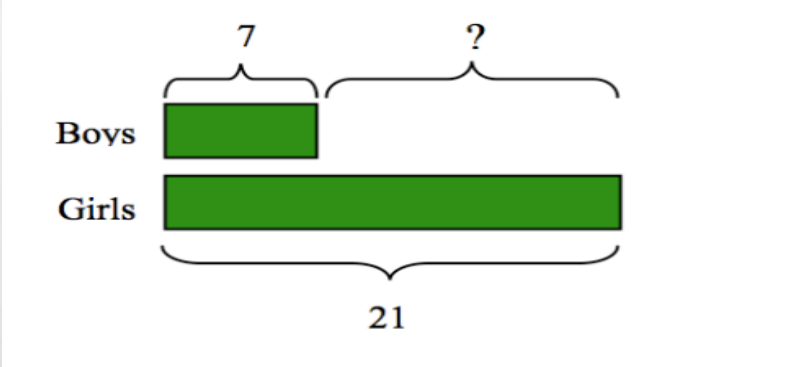
CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)

Part Whole Model
Bar Model



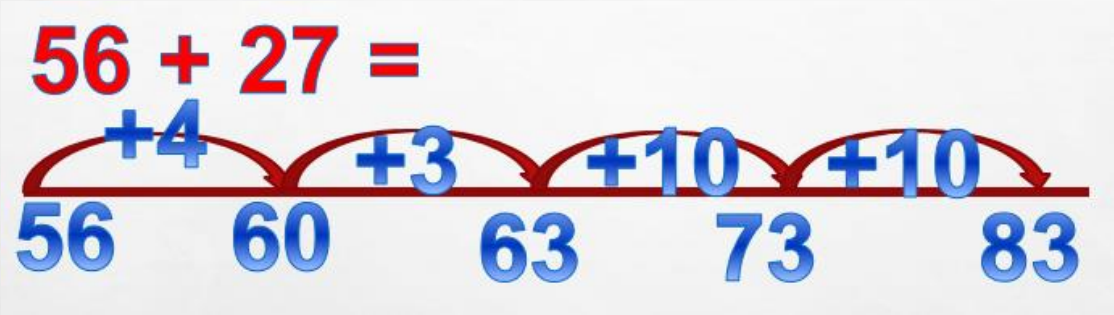


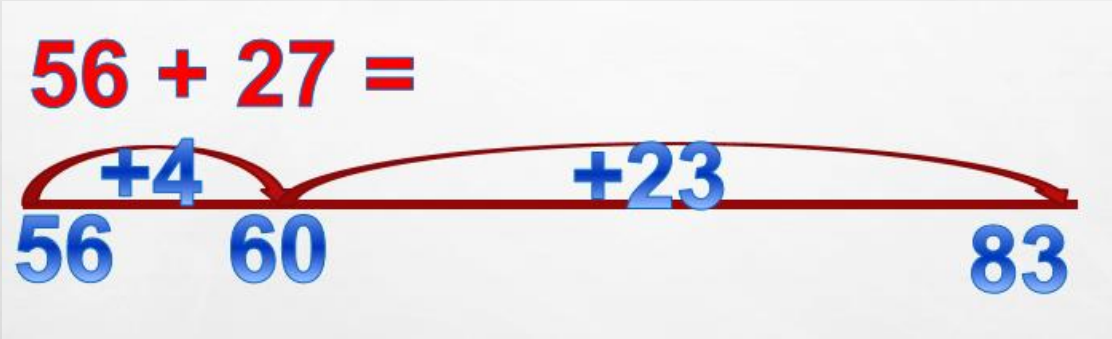




ABSTRACT (Y3&Y4)

Number lines - Addition

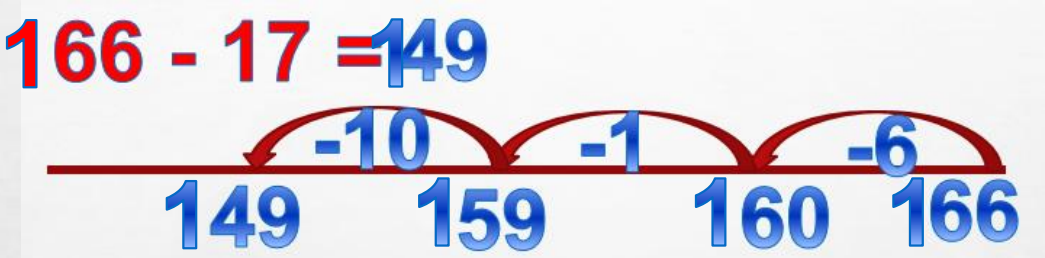


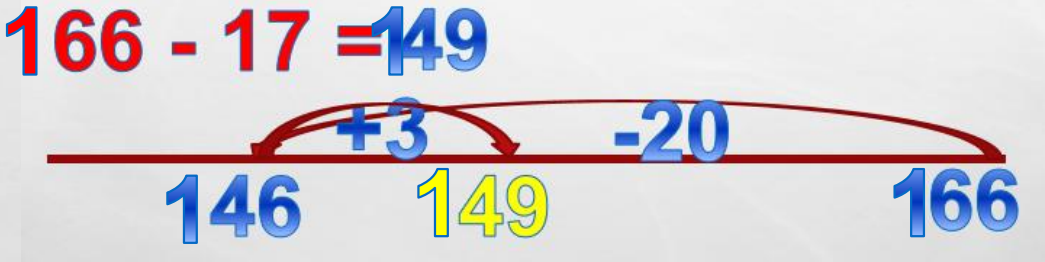


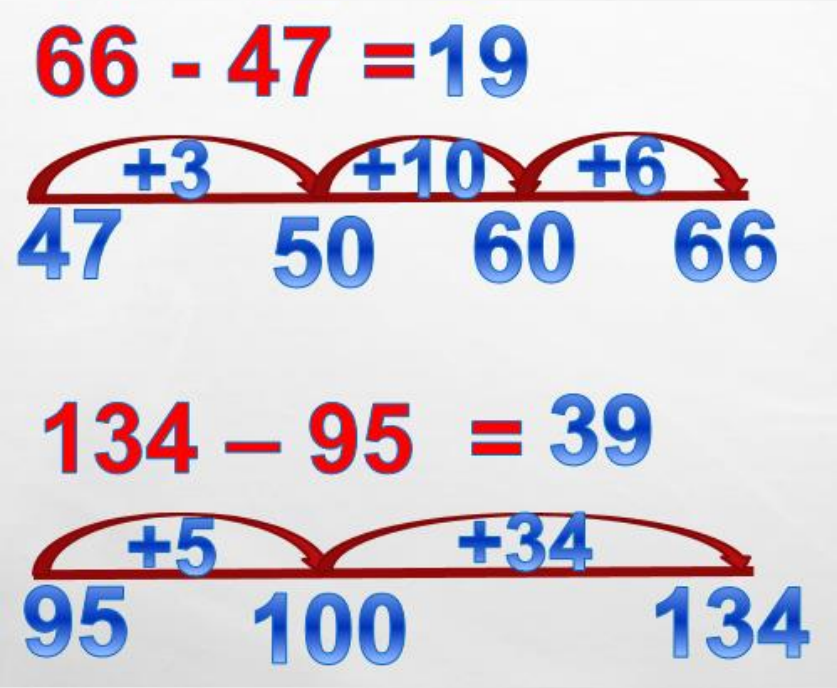
Starting with the largest value
Partitioning hundreds, tens and ones
Adding ones first
Using make 10 (number bonds)
Rounding and adjusting
Efficiency

ABSTRACT (Y3&Y4)

Number lines - Subtraction







Counting back
Staring from the larger value
Partitioning the values being subtracted
Using number bonds to get to a boundary
Rounding and adjusting

Counting on
(when numbers are similar/close in value)
Start with smaller value number
Working out the difference (count the jumps)
Partitioning the values being subtracted
Using number bonds to get to a boundary

ABSTRACT (Y3&Y4)

Partitioning

TO	TO	TO
42 +	43 =	
40 +	40 =	80
2 +	3 =	5

80 + 5 = 85

'If I know 4 and 4 makes 8, then I know 40 and 40 make 80.'

TO	TO	TO
46 -	32 =	
46 -	30 =	16
16 -	2 =	14

TO	TO	TO
46 -	37 =	
46 -	30 =	16
16 -	6 =	10
10 -	1 =	9

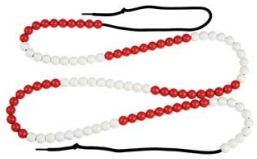
We do not partition BOTH numbers for subtraction because…

46 – 37 =

40 – 30 =

6 – 7 =

there are not enough ones here and we go into negative numbers.



Finding the difference, i.e. 32 – 25

Find 32 and 25 on a bead string and look at how many beads are between.

ABSTRACT (Y3&Y4)

Expanded column - Addition

856 + 123 =

800 + 50 + 6
+
100 + 20 + 3

900 + 70 + 9

979

856 + 376 =

800 + 50 + 6
+
300 + 70 + 6

1,100 + 120 + 12

1,232

Year 4 also use the expanded method with decimals.

ABSTRACT (Y4)

Short column - Addition

	H	T	O
	8	5	6 +
	1	2	3
	9	7	9

	H	T	O
	1	1	
	8	5	6 +
	3	7	6
1,	2	3	2

Expanded column is an important stepping stone to short column due to the importance of understanding exchanging.

ABSTRACT (Y3&Y4)

Expanded column - Subtraction

856 - 123 =

800 + 50 + 6 -

100 + 20 + 3

700 + 30 + 3

733

856 - 278 =

700 140

~~800~~ + ~~50~~ + 16 -

200 + 70 + 8

500 + 70 + 8

578

This can also be done without the + symbols, as some children find this confusing because it is subtraction.

8.6 - 1.3 =

8 + 0.6

1 + 0.3 -

7 + 0.3

7.3

8.6 - 4.7 =

~~8~~ 7 + 1 0.6

4 + 0.7 -

3 + 0.9

3.9

ABSTRACT (Y4)

Short column - Subtraction

H	T	O
8	5	6 -
1	2	3
7	3	3

H	T	O
~~8~~ 7	~~5~~ 14	16 -
2	7	8
5	7	8

Expanded column is an important stepping stone to short column due to the importance of understanding exchanging.

YOUR TURN

Have a go at calculating these equations using different methods (both informal (mental concrete or pictorial) or formal (written abstract).

YEAR 3	YEAR 4	YEAR 3	YEAR 4
1. 125 + 9	1. 1,623 + 156	1. 224 - 8	1. 1,257 - 124
2. 115 + 28	2. 1,292 + 1,035	2. 241 - 35	2. 1,473 - 1,037
3. 131 + 123	3. 1,782 + 1,439	3. 316 - 127	3. 1,439 - 1,206

YEAR THREE – MASTERY - ADDITION

Children know and can explain:

- what happens to the digits when counting in or adding on tens and hundreds;
- how to partition numbers in different ways, without altering the value of the number;
- when it is efficient to partition just the second number and when to partition both numbers;
- what is the same and what is different about different calculation methods for the same equation;
- the important role of inverse for checking accuracy; and
- how to use inverse to make related facts, developing fluency in finding related addition and subtraction facts (i.e. bar model).

Mastery			Mastery with Greater Depth
What do you notice? Is there a relationship between the calculations?			For positive integers are the following statements always, sometimes or never true? ■ The sum of 2 odd numbers is even. ■ The sum of 3 odd numbers is even. ■ Adding 5 to a number ending in 6 will sum to a number ending in 1. ■ Adding 8 to a number ending in 2 will always sum to a multiple of 10. Explain why in each case.
500 + 400 =	523 + 400 =	523 + 28 =	
400 + 500 =	423 + 500 =	423 + 28 =	
300 + 600 =	323 + 600 =	323 + 28 =	
200 + 700 =	223 + 700 =	223 + 28 =	
100 + 800 =	123 + 800 =	123 + 48 =	

YEAR FOUR – MASTERY - ADDITION

Children know and can explain:

- **how to partition numbers in different ways, without altering the value of the number (<u>including decimal numbers</u>);**
- **what is the same and what is different about different calculation methods for the same equation;**
- **how reordering (28 + 75, 75 + 28 (thinking of 28 as 25 + 3)), near doubles (160 +170 = double 150 + 10 +20 or double 160 +10 etc) and bridging and adjusting (138 + 69, 138 + 70 – 1) are more efficient mental methods; and**
- **how to use known facts and place value knowledge to find related facts, i.e. calculate time problems, bar model problems.**

Mastery		Mastery with Greater Depth	
Fill in the missing numbers.	352 + ☐ = 480 70 + 99 + ☐ = 270 ☐ – 55 = 84 ☐ – 3000 = 600	Fill in the missing digits.	1☐3 + 6☐ = 200 1☐5☐ + 300 = 1557 5☐28 – 44☐ = 4788 ☐☐☐0 – 2468 = 5092

YEAR THREE – MASTERY - SUBTRACTION

Children know and can explain:

- what happens to the digits when counting in or adding on tens and hundreds;
- how to partition numbers in different ways, without altering the value of the number;
- why we only partition the second number for subtraction;
- when it is efficient to partition just the second number and when to partition both numbers;
- what is the same and what is different about different calculation methods for the same equation;
- the important role of inverse for checking accuracy; and
- how to use inverse to make related facts, developing fluency in finding related addition and subtraction facts (i.e. bar model).

YEAR FOUR – MASTERY - SUBTRACTION

Children should be able to:

- **investigate when re-ordering works as a strategy for subtraction, i.e. 20 – 3 – 10 = 20 – 10 – 3, but 3 – 20 – 10 would give a different answer;**
- **use inverse (addition facts) and place value knowledge to accurately identify missing numbers in problems;**
- **how to partition numbers in different ways, without altering the value of the number (<u>including decimal numbers</u>);**
- **what is the same and what is different about different calculation methods for the same equation;**
- **adjust values to make mental calculations easier, i.e. when subtracting 18, subtract 20 and then add 2.**

Mastery		Mastery with Greater Depth	
Fill in the missing numbers.	352 + ☐ = 480 70 + 99 + ☐ = 270 ☐ – 55 = 84 ☐ – 3000 = 600	Fill in the missing digits.	1☐3 + 6☐ = 200 1☐5☐ + 300 = 1557 5☐28 – 44☐ = 4788 ☐☐☐0 – 2468 = 5092

MULTIPLICATION AND DIVISION

Written methods taught…

Year Two – Arrays, Number Lines and Partitioning

Year Three – Same as Year Two and Grid Method

Year Four – Same as Year Three and Expanded Column (ending with Short Column)

… but there are many mental methods that support these.

NUMBER SENSE

Year 3 and 4 continue to work on missing values and reverse equations, i.e. 7 = ? x ?

Year 3 and 4 continue to work on fact families and working systematically.

Number sense

Known facts

Sequence

Inverse

Patterns

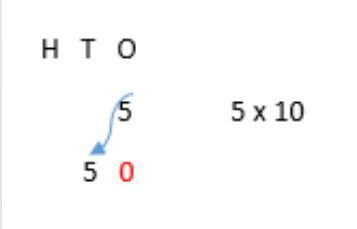
Commutativity

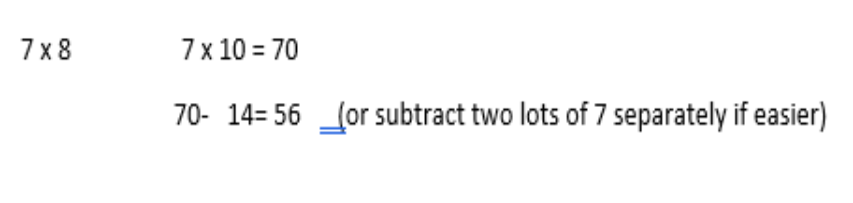
Using known facts to derive known facts

0	0
3	9
6	18
9	27
12...	36...

Using known facts to derive known facts, i.e. 'If I know 7 x 3 = 21, then I also know 70 x 3 = 210 and I also know that 70 x 30 = 2,100'.

Doubling and halving...
12 x 2 = 10x2 + 2x2
144 ÷ 12 = 5lots(60) and 5lots(60) and 2lots(24) = 12

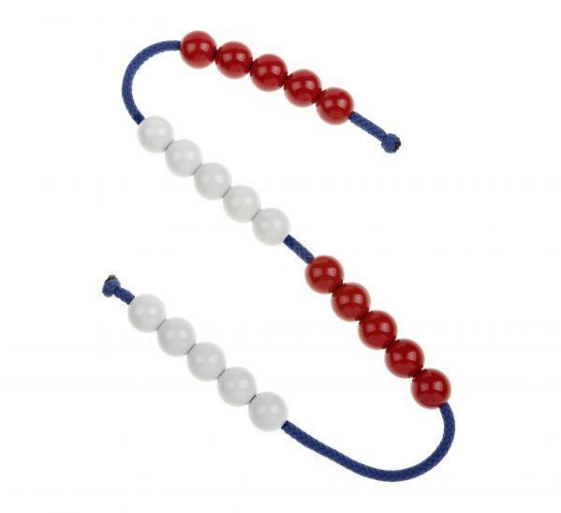


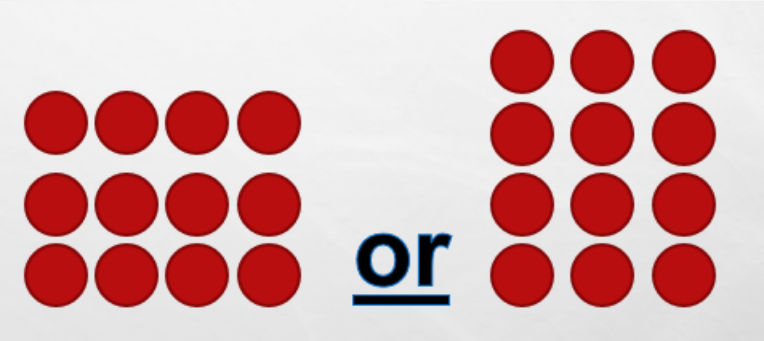


Year 3 work on 3, 6, 4 and 8 times tables. Year 4 work on all facts to 12 x 12.

CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)

Beadstring

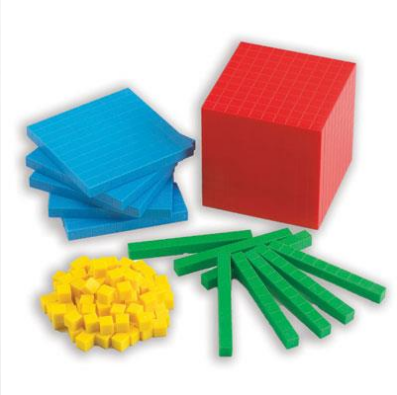


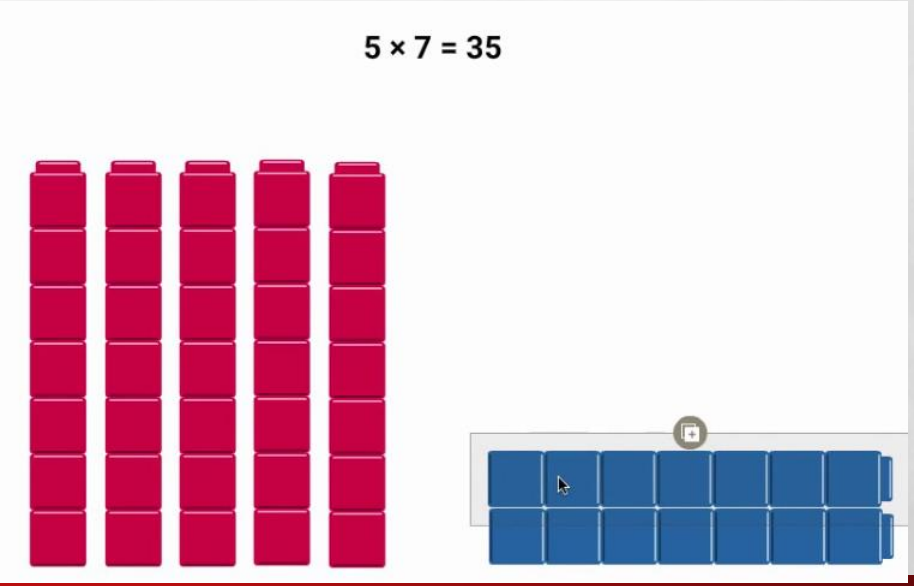


Counters

Dienes

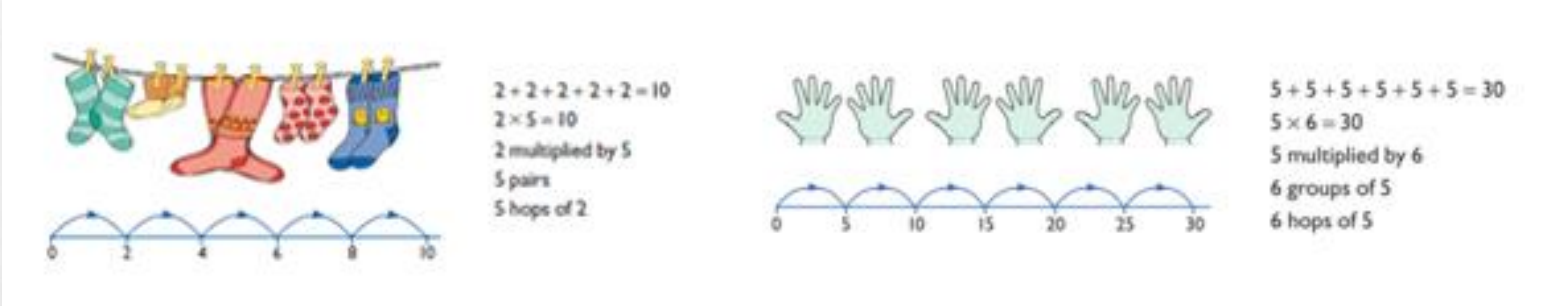
Cubes

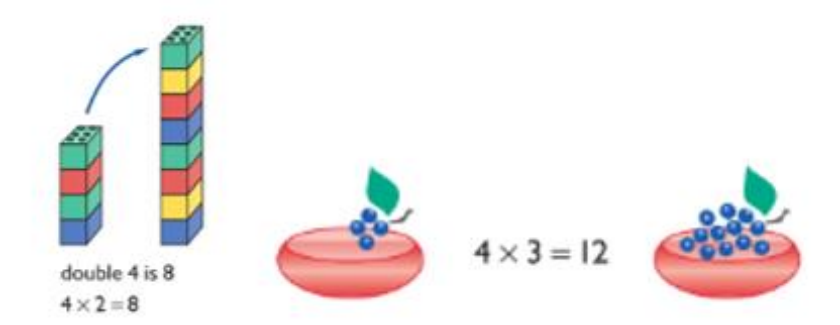




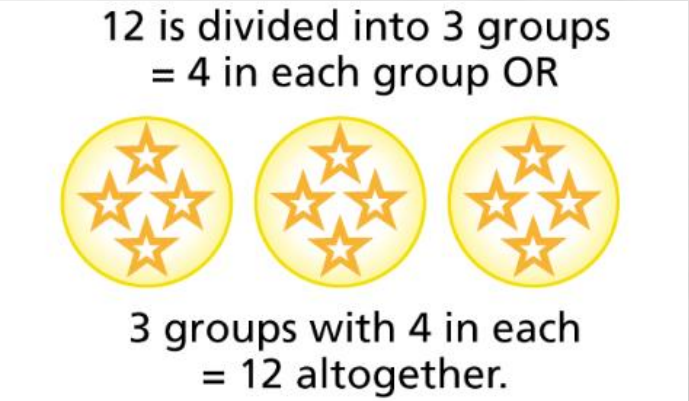
Using known facts to derive facts

CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)





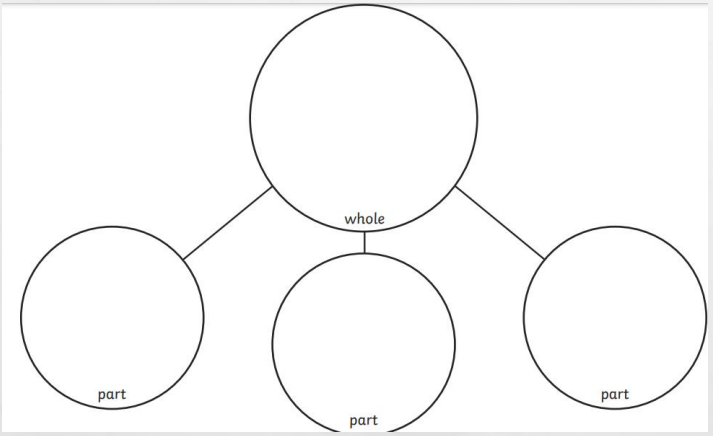
Grouping **Repeated addition (multiplication)** **Repeated subtraction (division)**

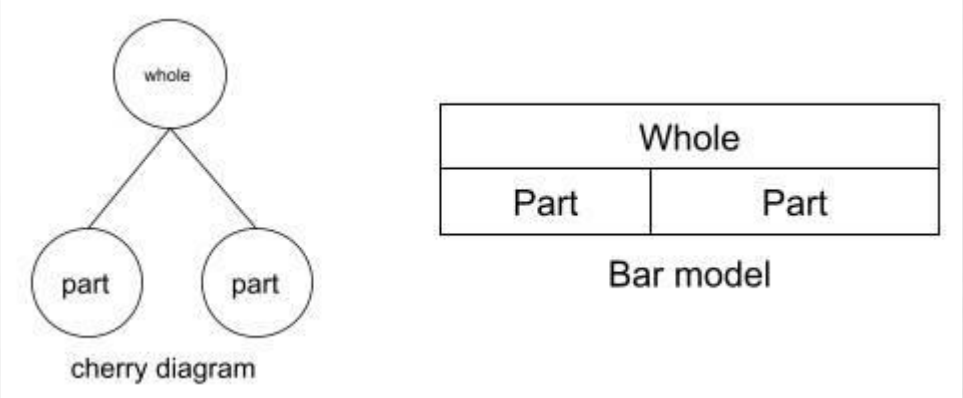


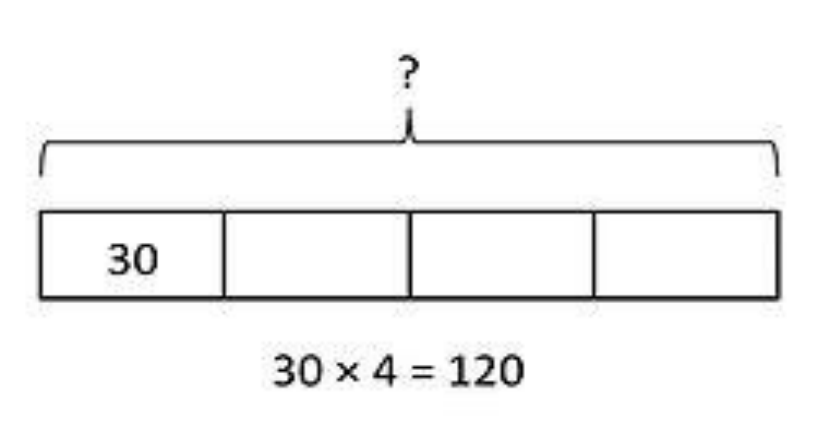
CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)

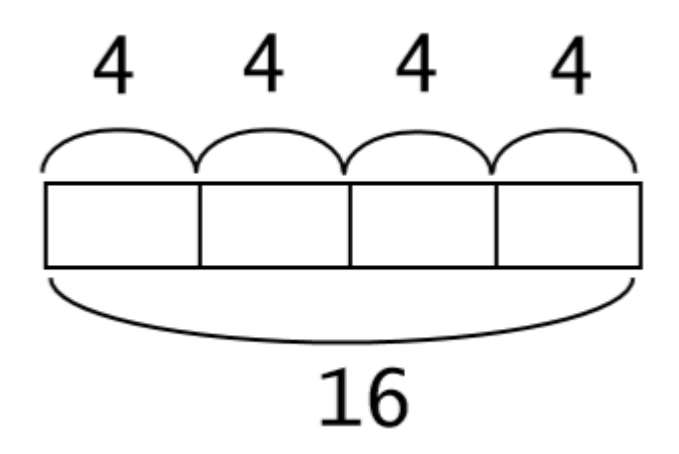
Part Whole Model

Bar Model



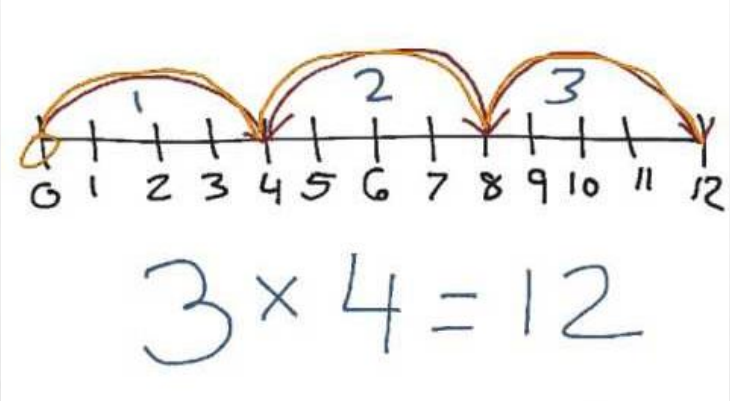




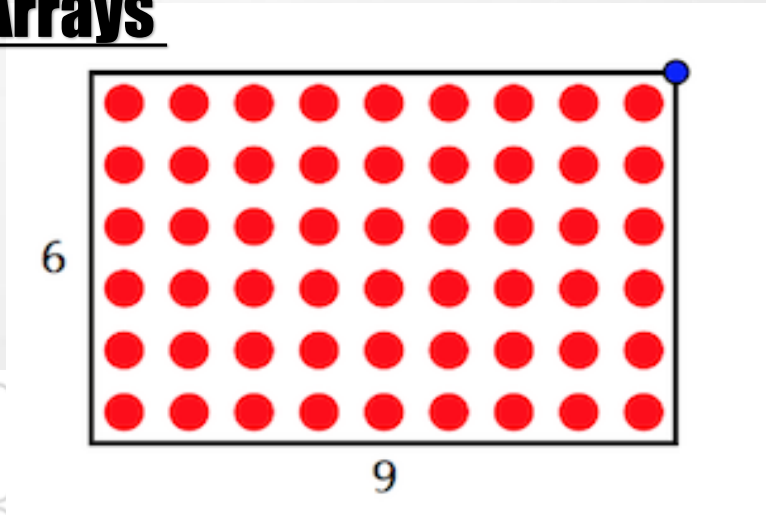


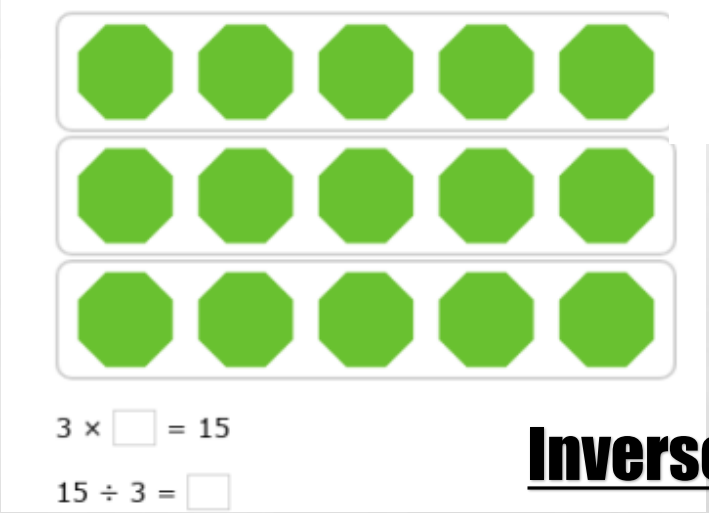
CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)

Skip counting and skip counting on a number line



Arrays

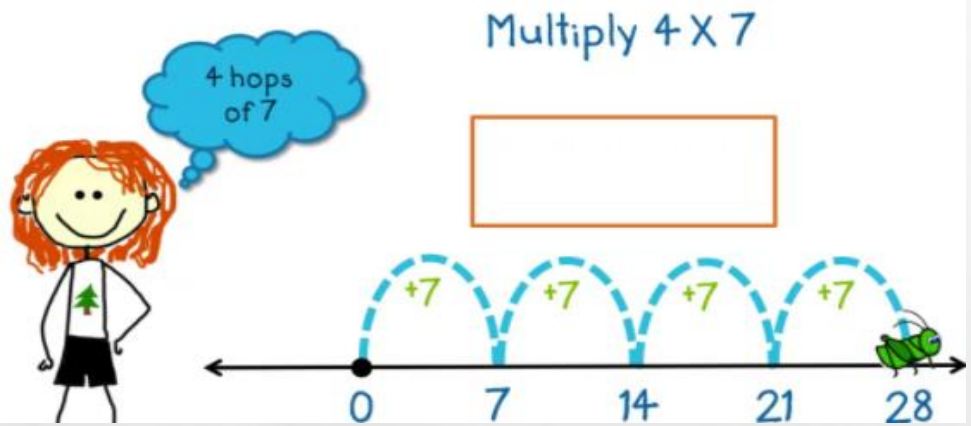


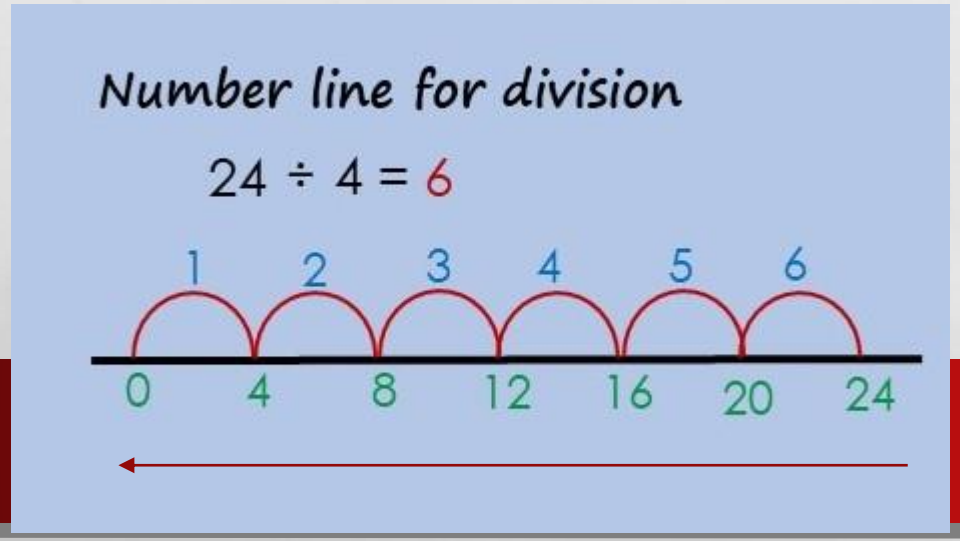


Inverse

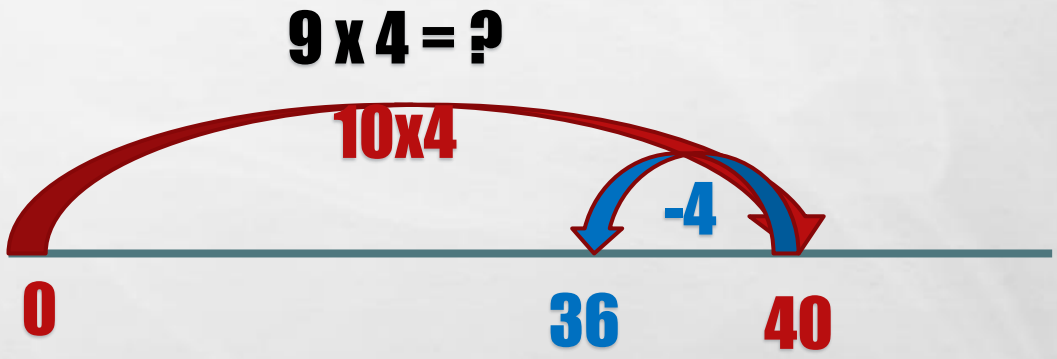
CONCRETE – PICTORIAL – ABSTRACT (Y3&Y4)

Multiplication and division number lines





Using inverse



Rounding and adjusting

ABSTRACT (Y3&4)

Partitioning

15 x 4 =
10 x 4 = 40
5 x 4 = 20

40 + 20 = 60

25 x 3 =
10 x 3 = 30
10 x 3 = 30
5 x 3 = 15

30+30+15= 75

60 ÷ 5 =
50 ÷ 5 = 1 0
10 ÷ 5 = 2

1 2

110 ÷ 10 =
100 ÷ 10 = 1 0
10 ÷ 10 = 1

1 1

ABSTRACT (Y3&4)

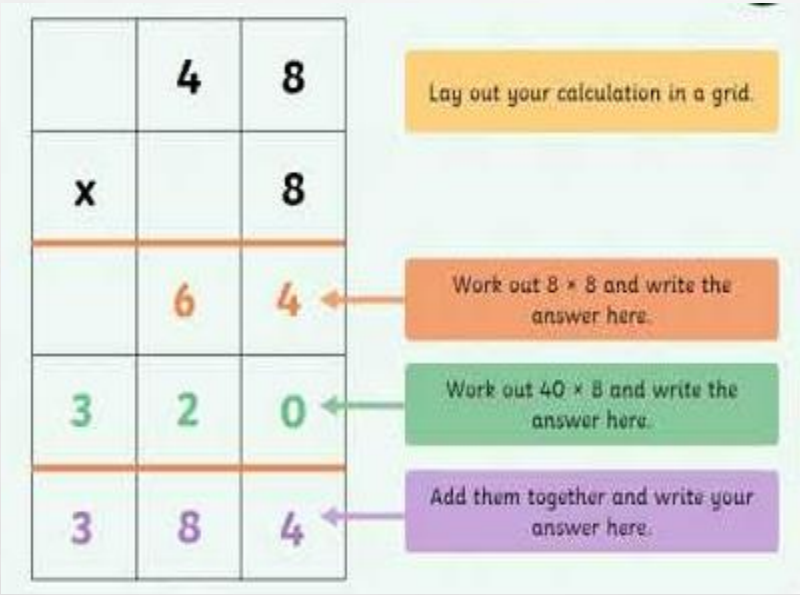
Grid Method

22 x 35 =

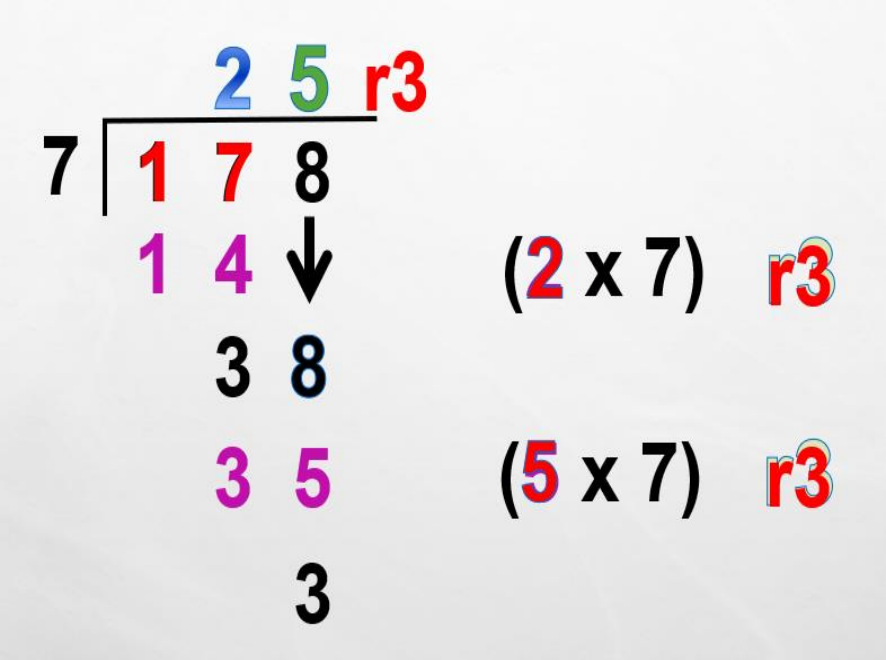
x	30	5
20	20 x 3 x 10 600	2 x 5 x 10 100
2	2 x 3 x 10 60	2 x 5 10

600 + 100 + 60 + 10 = 770

Expanded Multiplication



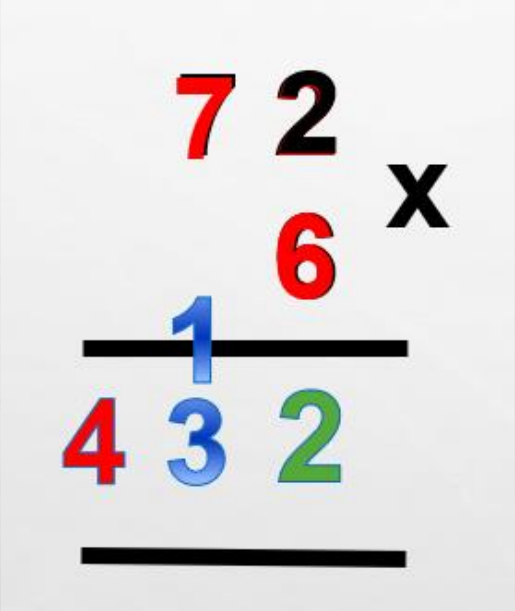
Expanded Division



Year 3 do not work with remainders. Year 4 do work with remainders.

ABSTRACT (Y4)

Short Multiplication



Short Division

TO ÷O

HTO÷O

Year 4 start out on expanded methods (with and without remainders), building towards short methods at the end of the year.

YOUR TURN

Have a go at calculating these equations using different methods (both informal (mental concrete or pictorial) or formal (written abstract).

<u>Year 4 (challenge): Which is the most efficient method?</u>

YEAR 3	YEAR 4
1. 9 X 4	1. 9 X 8
2. 13 X 3	2. 18 X 5
3. 6 X 8	3. 110 X 7

YEAR 3	YEAR 4
1. 48 ÷ 4	1. 124 ÷ 8
2. 72 ÷ 8	2. 120 ÷ 40
3. 24 ÷ 3	3. 125 ÷ 7

YEAR THREE – MASTERY - MULTIPLICATION

Children should:

- **identify patterns and relationships within times tables and between others, i.e. using a hundred square or times table grid, look for number patterns within times tables and ones that cross over into other times tables;**
- **be able to use multiplication facts to fill in missing number problems;**
- **start to notice the relationship between 2 x and 4x, 5 x and 10 x etc.**

Mastery	Mastery with Greater Depth
What is the relationship between these calculations? 3×4 4×8 4×3 8×4 *Children should understand that multiplication is commutative.*	What is the relationship between these calculations? 2×3 4×3 2×30 4×30 20×3 40×3 $20 \times 3 \times 10$ $40 \times 3 \times 10$ *Children should use their knowledge of place value to mentally calculate by multiples of 10.*
What do you notice about the following calculations? 3×4 3×8 4×4 4×8 3×5 3×10	Write these addition statements as multiplication statements: $2 + 2 + 2 + 2 + 4$ $3 + 3 + 3 + 2 + 4$

YEAR FOUR – MASTERY - MULTIPLICATION

Children should be able to:

- identify which multiples are multiples of another, i.e. multiples of 10 are also multiples of 5, multiples of 5 are also multiples of 10;
- identify relationships within times tables and use them for efficiency, i.e. x5 is half the answer of x10 (which is quick and easy to calculate);
- use relationships and patterns of known facts to work out unknown multiplication facts;
- understand both 'commutative' and 'distributive' and use these mathematical rules when it is most efficient/appropriate.

Mastery	Mastery with Greater Depth
Use your knowledge of multiplication tables to complete these calculations. $7 \times 6 =$ $7 \times 2 \times 3 =$ $8 \times 7 =$ $2 \times 4 \times 7 =$ $2 \times 2 \times 2 \times 7 =$ $12 \times 6 =$ $13 \times 6 =$ $12 \times 12 =$ $12 \times 13 =$ $12 \times 0 =$ Which calculations have the same answer? Can you explain why? *By the end of the year pupils should be fluent with all table facts up to 12×12 and also be able to apply these to calculate unknown facts, such as 12×13.*	True or false? $7 \times 6 = 7 \times 3 \times 2$ $7 \times 6 = 7 \times 3 + 3$ Explain your reasoning. Can you write the number 30 as the product of 3 numbers? Can you do it in different ways?

YEAR THREE – MASTERY - DIVISION

Children should:

- use inverse (multiplication facts) to work out division calculations more quickly and accurately;
- know that there are four equations for any one fact, i.e. 12 ÷ 2 = 6, 12 ÷ 6 = 2, 6 x 2 = 12, 2 x 6 = 12.

YEAR FOUR – MASTERY - DIVISION

Children should be able to:

- look for multiples of 10 or 100 to mentally calculate quicker, i.e. 120 ÷ 6 (12 ÷ 6 = 2 but 12 is ten times smaller than 120 so this answer needs to be multiplied by ten);
- use place value knowledge of times table facts to find decimal facts;
- use inverse (multiplication facts) to work out division calculations quickly and accurately, including missing number problems.

Did you know... ?
Do you teach...?

TIMES TABLES

Five times table

- Cut in half, then times 10
  Example: 5x6: Cut 6 in half to get 3, then times 10 for **30**
- Or times 10 then cut in half
  Example: 5x9: 9 times 10 is 90, then cut in half for **45**
- Also the last digit goes 5, 0, 5, 0, - like this: **5**, 1**0**...

Six times table

- Multiply by 5 and add your number on once more
- When you multiply 6 by an even number, they both end in the same digit.
  Examples: 6×**2**=1**2**, 6×**4**=2**4**, 6×**6**=3**6**, etc

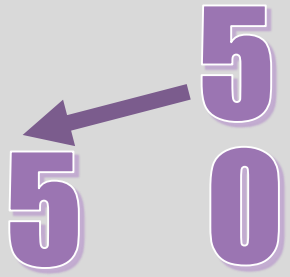
Eight times table

- Double, double, double!
  Example: 8×6: double 6 is 12, double 12 is 24, double 24 is **48**
- Multiply by ten, multiply by two and take the second number away from the first number.

Nine times table

10x your number and then minus your number once.
Example: 9×6 = 10×6−6 = 60−6 = 54

Ten times table



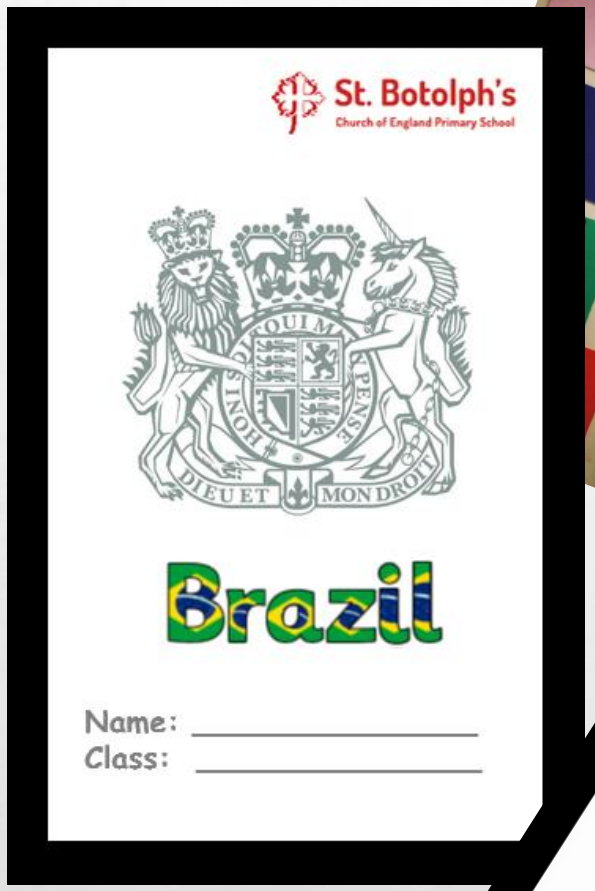
- Multiplying (move **all** digits to left) and Dividing (to the right)
- 10 (move once as one zero), 100 (twice as two zeroes) etc

Twelve times table

- is 10× plus 2×
  Example: 12×**4** = **40**+**8** = 48
- Double 6x

Learn OUT of sequence (as well as in sequence) + timed (when ready)

2 x	12 x	18 ÷ 9 =	108 ÷ 9 =
4 x	1 x	36 ÷ 9 =	9 ÷ 9 =
8 x	3 x	72 ÷ 9 =	27 ÷ 9 =
5 x	0 x	45 ÷ 9 =	0 ÷ 9 =
10 x	7 x	90 ÷ 9 =	63 ÷ 9 =
9 x	5 x	81 ÷ 9 =	45 ÷ 9 =
3 x	2 x	27 ÷ 9 =	18 ÷ 9 =
6 x	11 x	54 ÷ 9 =	99 ÷ 9 =
12 x	10 x	108 ÷ 9 =	90 ÷ 9 =
1 x	6 x	9 ÷ 9 =	54 ÷ 9 =
0 x	4 x	0 ÷ 9 =	36 ÷ 9 =
11 x	9 x	99 ÷ 9 =	81 ÷ 9 =
7 x	8 x	63 ÷ 9 =	72 ÷ 9 =



Passports

Different destinations

+

Different maths objectives

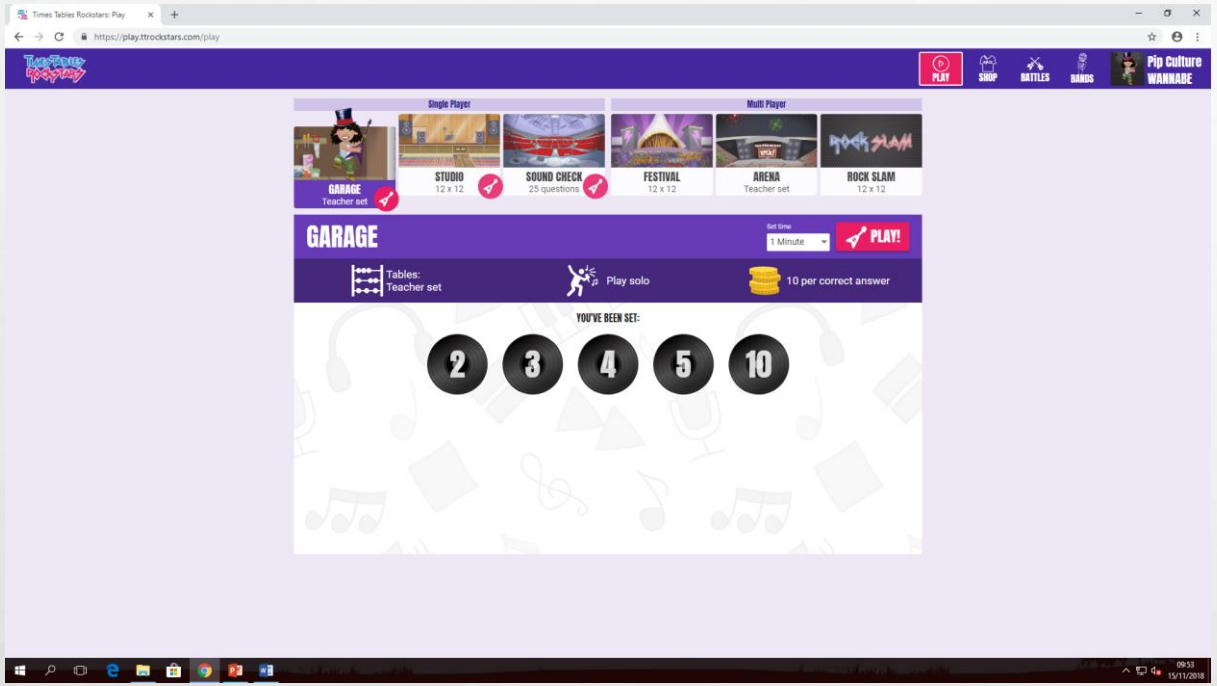
=

Travel around the world, mastering arithmetic skills (and much more)!

+

Prizes/rewards

Apps (Year 2 - 6)



doodlemaths

SUMMARY

- There is lots to remember – think about the poor children!
- Progressions are essential in facilitating an understanding of place value and mathematical process.
- A ‘rush’ through the progressions will hinder long term progress.