

New Maths Curriculum For Parents

Crossways schools

Key facts about the new curriculum

Year 1-6

- Laid out in terms of age related expectations
- Children are taught their year group expectations
- Pitch of calculation has increased
- Cross – Curricular links with Science, Computing and Geography
- Raised emphasis on pupils applying their mathematics to a whole range of problems.
- Emphasis on pupils mastering skills rather than adding layers of knowledge

Number and place value <ul style="list-style-type: none"> count in multiples of 8, 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) and know that over time, the numeral system changed to include the concept of zero and place value. 	Addition and Subtraction <ul style="list-style-type: none"> 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, deciding which operations and methods to use and why. 	Multiplication and Division <ul style="list-style-type: none"> recall multiplication and division facts for multiplication tables up to 12×12 use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers recognise and use factor pairs and commutativity 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, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.
Fractions including decimals <ul style="list-style-type: none"> recognise and show, using diagrams, families of common equivalent fractions count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number add and subtract fractions with the same denominator recognise and write decimal equivalents of any number of tenths or hundredth recognise and write decimal equivalents to $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths round decimals with one decimal place to the nearest whole number compare numbers with the same number of decimal places up to two decimal places solve simple measure and money problems involving fractions and decimals to two decimal places. 	Measures <ul style="list-style-type: none"> Convert between different units of measure [for example, kilometre to metre; hour to minute] measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares estimate, compare and calculate different measures, including money in pounds and pence read, write and convert time between analogue and digital 12- and 24-hour clocks solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. 	Geometry – properties of shape <ul style="list-style-type: none"> compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify acute and obtuse angles and compare and order angles up to two right angles by size identify lines of symmetry in 2-D shapes presented in different orientations complete a simple symmetric figure with respect to a specific line of symmetry. Geometry – position and direction <ul style="list-style-type: none"> describe positions on a 2-D grid as coordinates in the first quadrant describe movements between positions as translations of a given unit to the left/right and up/down plot specified points and draw sides to complete a given polygon.
Statistics <ul style="list-style-type: none"> interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. 		

Broad areas of study

Number, place value and rounding

approximation and estimation from Y5

Addition and subtraction

Multiplication and division

Fractions

decimals from Y4, percentages from Y5

Algebra from Y6

Measures

Geometry – properties of shapes

Geometry – position, direction, motion

Statistics

Ratio and proportion

A few new things/changes in pitch...

- Roman numerals – read clocks (y3)
- Roman numerals – read (y4)
- Knowing times tables and division facts to 12 x 12 – Y4
- Volume and capacity –Y1 onwards
- Area of parallelograms and triangles (Y6)
- Multiplication and division problems (y1)
- Finding $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ of sets, shapes and quantities (y2)
- Imperial measures (y5)
- Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius (y6)
- Long multiplication and long division (y6)

Assessment in maths

Age related expectations rather than levels

Tests in year 2 and year 6

Arithmetic test and problem solving papers

All pupils will have a go at the papers

Sample of year 6 pupils will sit the new times tables test and rolled out in 2017.

End of year 2 expectations

1 $5 + 7 = \square$

2 $19 - 9 = \square$

23 $65 + \square = 93$



24 $\frac{1}{3}$ of 21 = \square

28 Abdul goes to the zoo.

He finds out the mass of some animals.



Compare the mass of the animals.

Write $<$ or $>$ or $=$ in each box.

Cheetah's mass \square Tiger's mass

Tiger's mass \square Lion's mass

30 Look at these fractions.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{4}$ $\frac{3}{4}$

Circle the **two** fractions that are equal.

31 Complete the number sentence below.

$3 \times 8 = 2 \times \square$

End of year 6 expectations

4 $24 \times 3 =$

1 mark

5 $1,034 + 586 =$

1 mark

6 $48 \div 6 =$

26 $\frac{1}{4} \times \frac{1}{8} =$

1 mark

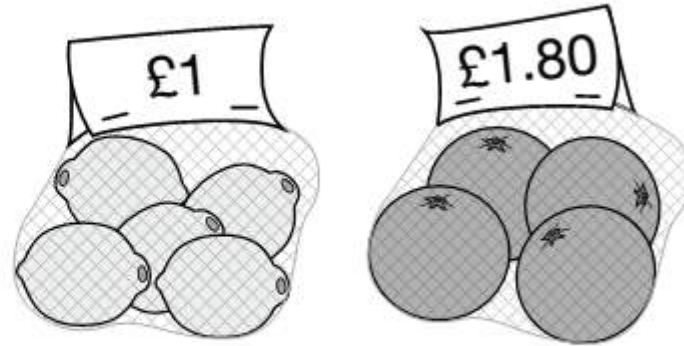
27 95% of 240 =

1 mark

28 $234,897 - 45,996 =$

A bag of 5 lemons costs £1

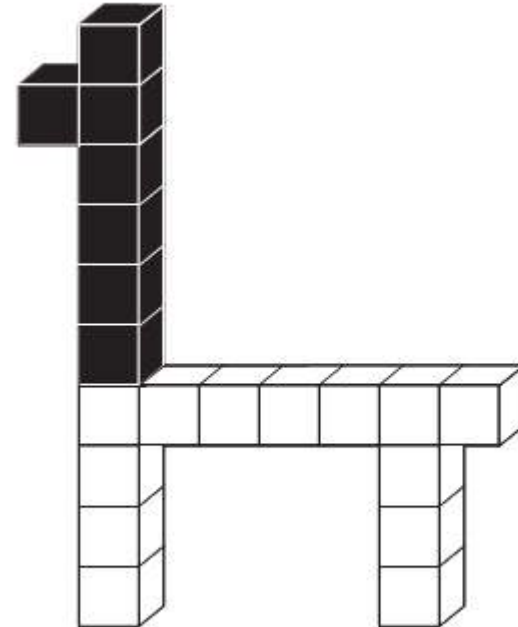
A bag of 4 oranges costs £1.80



How much **more** does one orange cost than one lemon?

$$\begin{array}{r} \square \quad 6 \quad \square \quad 8 \\ + \quad 3 \quad \square \quad 9 \quad \square \\ \hline 9 \quad 0 \quad 1 \quad 9 \end{array}$$

This model is made with 20 cubes.



What **percentage** of the cubes in the model is black?

What does it look like ?

- A block of lessons on a theme e.g. addition and subtraction
- Children are taught the skill and then how to apply it e.g. solve problems with money, time etc.
- Daily number skills- tables, bonds, known facts
- Children are made aware of maths and how it is used in other subjects such as Science, Art etc
- More maths is through a real life problem

Real life examples

- Ordering up to 100 million - use prices of football players, houses
- Rounding decimals – use times in formula 1 races, swimming times, athletics
- Money problems – which is the best deal ?
- Ordering the distance away from the sun for planets
- Sorting rocks and materials – using charts and tables

Resources you might see

Numicon



Diennes or base 10

Place Value counters

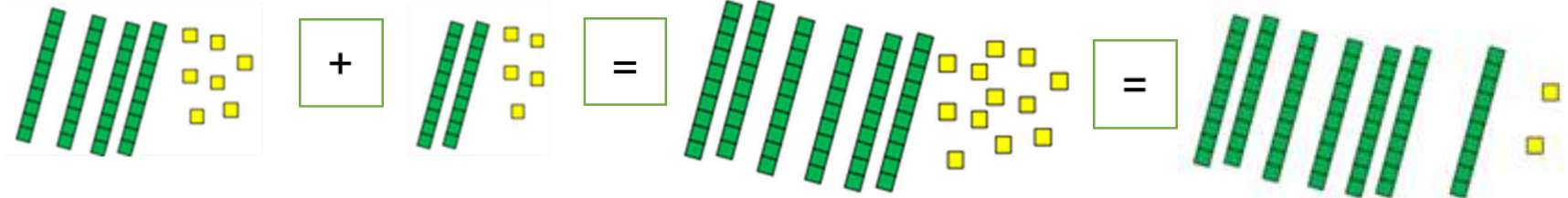
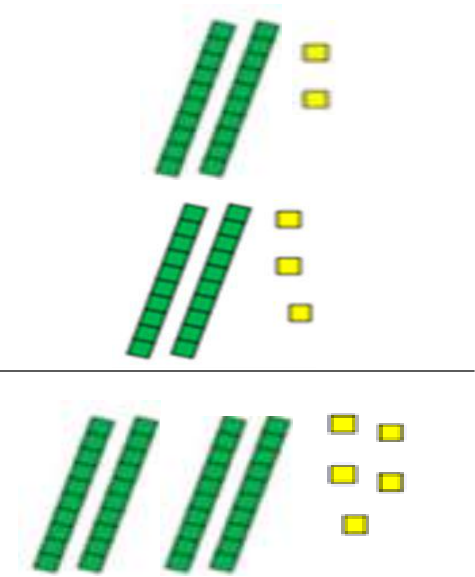


Number lines, 100 squares, tables, grids

Addition

$$\begin{array}{r} 22 + \\ \underline{23} \end{array}$$

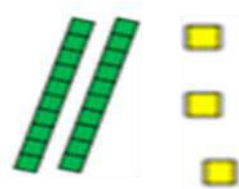
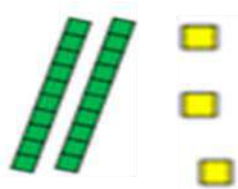
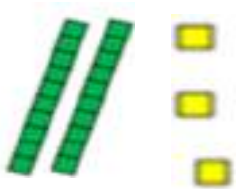
$$47 + 25 =$$



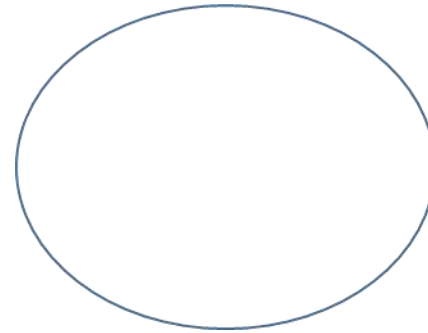
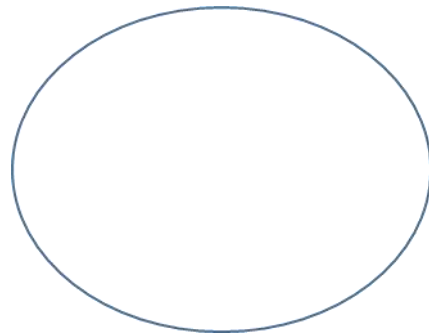
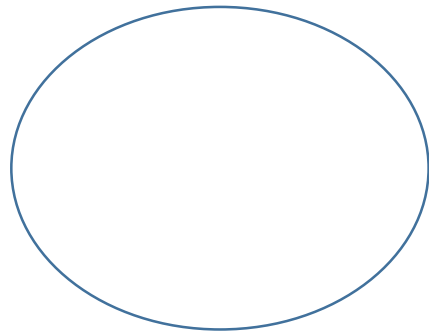
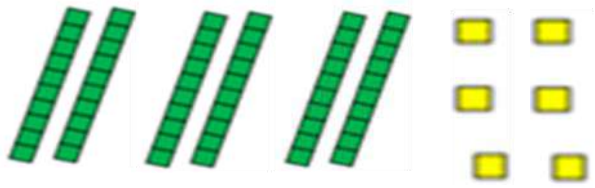
Multiplication and Division

How did you learn 13×5 ?

23×3



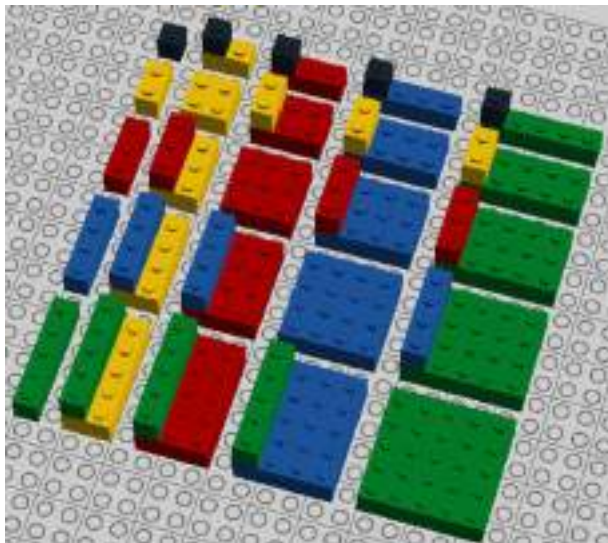
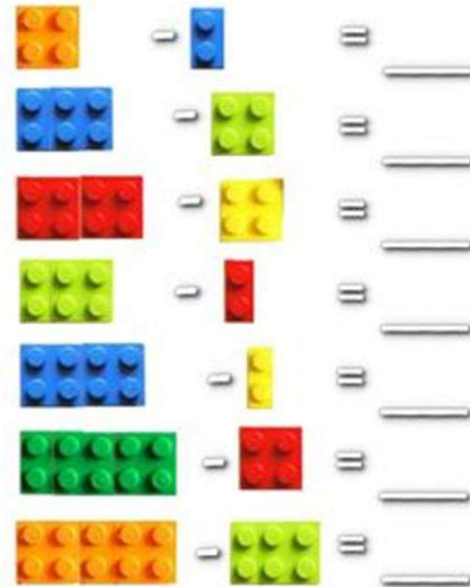
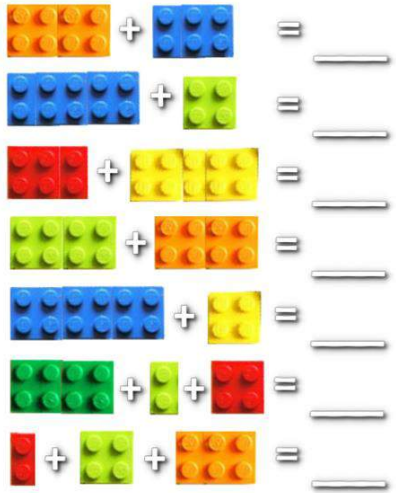
Division $66 \div 3 =$



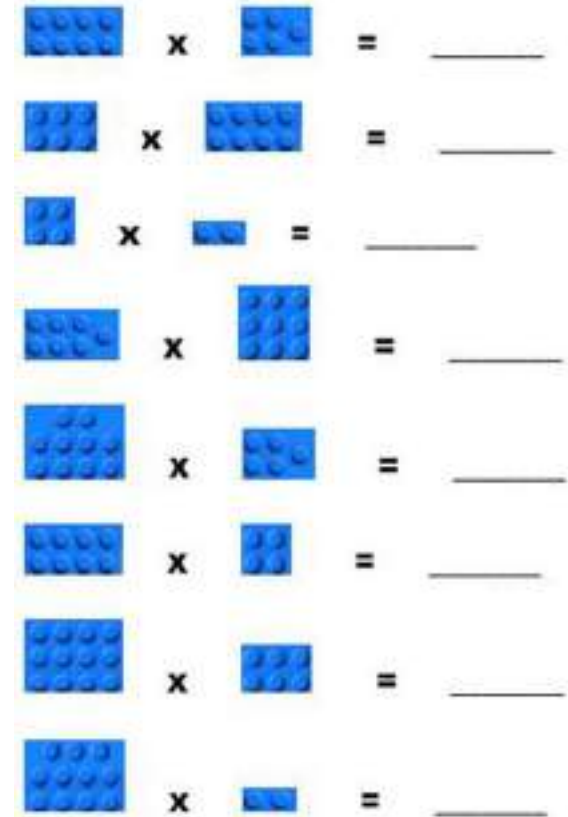
Maths with lego

- Sort and count bricks
- Sort and count based on number of studs
- Build a model – how many bricks, how many of each colour, how many studs
- Can you build me a model that has 10 bricks ?

LEGO to support calculation



LEGO MULTIPLICATION



Written Calculation Expectation

- Greater focus on known facts
- Column addition and subtraction
- Short and long multiplication
- Short and long division

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$$

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{78} \\ 20 \end{array}$$

Answer: 14

$$\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 874 \\ - 523 \\ \hline 351 \\ \hline \end{array}$$

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

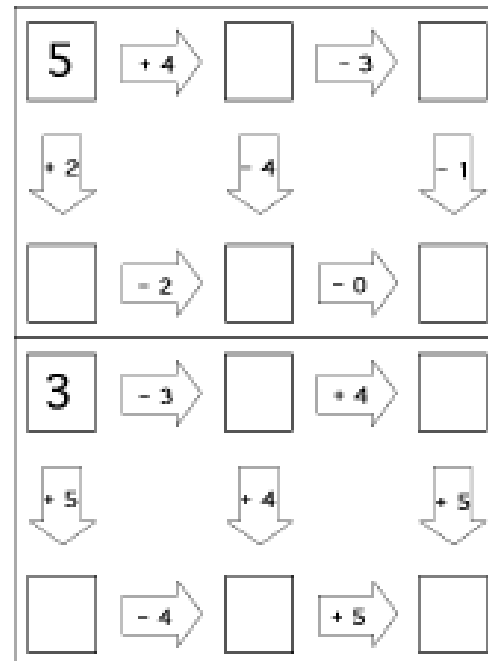
Card games

- Snap
- Rummy
- Pairs
- 21's
- Clock Patience

Practise times tables
Practise number bonds (pairs of numbers)

Newspaper puzzles

- Sudukos
- Missing numbers
- Dart board
- Function machine



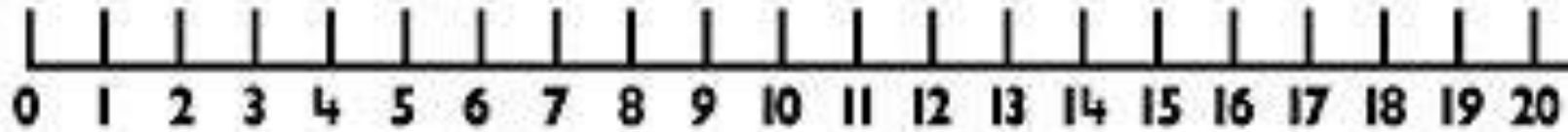
A 5x5 grid puzzle. The grid contains numbers and symbols. The top row has a box with '10' in the top right corner. The second row has a box with '-' in the top left, a black square in the top middle, a box with '-' in the top right, a black square in the middle left, a box with 'X' in the middle middle, and a box with '10' in the middle right. The third row has a box with 'X' in the bottom left, a black square in the bottom middle, a box with 'X' in the bottom right, a box with '+' in the bottom middle, and a box with '-9' in the bottom right. The fourth row has a box with '-' in the top left, a box with '-' in the top middle, a box with '+' in the top right, and a box with '0' in the top right. The bottom row has a box with '-1' in the bottom left, a box with '-33' in the bottom middle, and a box with '78' in the bottom right. Below the grid, the text reads: "Try to fill in the missing numbers."

Fun games to play at home

- Ladders
- Pick up sticks – use straws, pencils
- Games with dice
- Battleships
- Bingo
- Yatzee
- Monopoly
- Dominoes

Use the dominoes to make a tower that totals
20.

Number line game



$$6 + 5 = 11$$

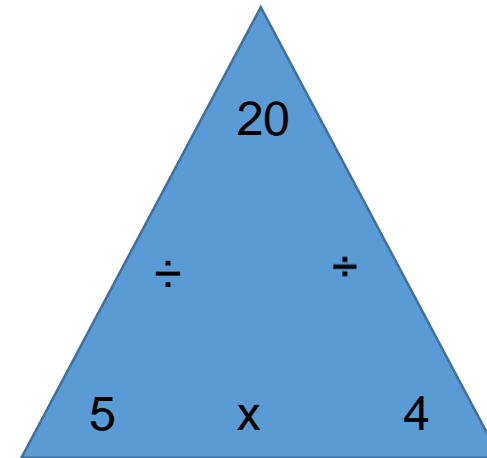
$$11 \text{ take away } 8 = 3$$

$$3 \times 5 = 15$$

$$15 \div$$

Practising times tables

- Songs
- Counting – rote
- Trios
- Using playing cards



Telling the time

- Days of week, months of the year
- Reading the clock – hour, half hour, quarter to, quarter past, five minute intervals, minute
- How many days in week
- How many months in year
- How many minutes in an hour, day...conversion between days and weeks, months and years etc.
- 12 hour and 24 hour clock
- Digital and analogue time
- Roman numeral clocks

Practising telling the time

- As often as possible reading clocks, watches, timetables
- Daily timetable
- Using digital devices at home – setting DVD to record etc
- Looking at radio times, tv times etc.
- Bus timetables, train timetables
- Shop opening and closing times
- How long tv programmes or films last, how long is the piece of music

Money

- Recognising coins and notes
- Different ways of making the same amount - what coins have I got in my purse/wallet ?
- How much is there ?
- Have I got enough for ?
- Shopping – 2 for 1 ? Using shopping vouchers
- Adding up the bills
- Swapping coins for fewer coins but the value is the same e.g 2p,2p,1p or 5p

How you can help at home

Learn number bonds and times tables

Practice telling the time, knowing days of week, months of the year, ordering days and months

Familiarisation with coins, simple shopping bills, value for money offers in shops

Playing board games – such as Yahtzee, Monopoly, snakes and ladders.

Play cards, darts, dominoes, snap, pick up sticks

Puzzles from the newspaper

Reading maths stories

Good websites to use

- BBC Bitesize
- BBC Skills wise
- Maths is fun
- Arcademic Skills Builder
- Activity Village maths games
- Cbeebies
- Sumdog



Some useful websites

<http://www.mathletics.co.uk/>

<http://www.primarygames.com/>

<http://mathschallenge.net/>

<http://www.sumdog.com/>

<http://www.mathsisfun.com/>

<http://www.whizz.com/>

<http://www.teachingtables.co.uk/>

<http://mathsframe.co.uk/>



Sumdog



Maths Challenge



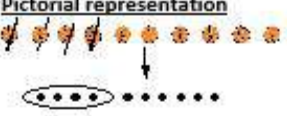


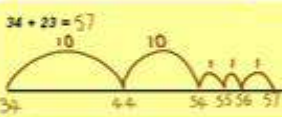
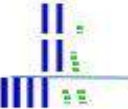

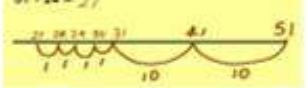
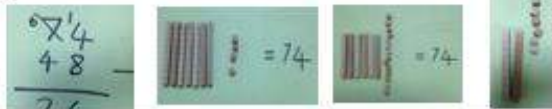






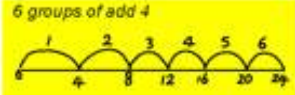
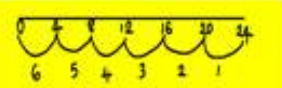

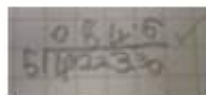
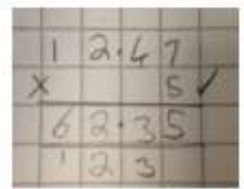

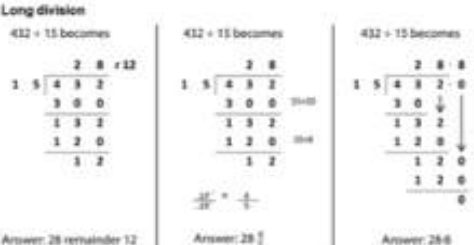
Maths apps

- Maths age 3-5
- Maths age 4-6
- Mental maths cards
- AB Maths lite
- Bee Bot
- 10 minutes a day
- Hungry fish
- Thinking blocks



Calculation Policy

PROGRESSION	ADDITION	SUBTRACTION
<p>Please see http://www.numicon.com/Ind ex.aspx for how to use Numicon.</p> <p>Number tracks and printed number lines can also be used at this level to support calculation</p>	<p>Pictorial representation</p>  <p>Practical representation</p>  <p>Number sentences</p> $5 + 1 + 3 + 2 + 1 + 1 = 13$	<p>Pictorial representation</p>  <p>Practical representation</p>  <p>Number sentences</p> $7 - 5 = 2$ $14 - 1 = 13$ $12 - 4 = 8$ $15 - 3 = 12$ $11 - 2 = 9$ $17 - 3 = 14$
<p>Use blank number line</p> <p>Teach to count on or back in tens first.</p> <p>Use diennes apparatus to demonstrate the value of digits.</p>	<p>Number lines</p> $5 + 7 = 12$  <p>Add ones</p> $34 + 23 = 57$  <p>Add tens</p> <p>Extend to using HTU</p>  <p>ALWAYS COUNT ABOVE THE LINE</p> $22 + 24 = 46$	<p>Number lines</p> $8 - 6 = 2$  <p>Subtract ones</p> <p>Subtract tens</p> $81 - 24 = 57$  <p>Extend to using HTU</p> <p>ALWAYS COUNT BACKWARDS BELOW THE LINE</p>
<p>Use expanded method to illustrate process if necessary.</p>	<p>Compact method</p> $367 + 185 = 431$ <p>either</p> $\begin{array}{r} 367 \\ +185 \\ \hline 12 \\ 140 \\ 400 \\ 552 \end{array}$ <p>or</p> $\begin{array}{r} 367 \\ + 23 \\ \hline 368 \end{array} \quad \begin{array}{r} 76 \\ + 54 \\ \hline 130 \\ 1 \end{array}$ <p>$400 + 140 + 12 = 552$</p> <p>Extend to using with larger numbers and decimals.</p>	<p>Compact method</p> $\begin{array}{r} 56 \\ -32 \\ \hline 24 \end{array}$  <p>Use apparatus to model the exchange process.</p> $\begin{array}{r} 9 \\ 7 \overline{) 807} \\ \underline{- 38} \\ 769 \end{array}$

PROGRESSION	MULTIPLICATION	DIVISION
Use the term equal	<p><u>Pictorial representation</u></p>  <p><u>Practical representation</u></p> 	<p><u>Pictorial representation</u></p>  <p><u>Use practical resources</u></p>  <p>Moving from a concept of halving a shape to halving a small quantity</p>
Using vocabulary 'groups of' when modelling process. You will count on in 'groups of...' or subtract in 'groups of...'. Use the number line to model remainders, when moving from practical to abstract	<p><u>Repeated addition</u></p> <p>$6 \times 4 = 24$</p> <p>6 groups of add 4</p>  <p>How many groups have I added?</p> <p>ALWAYS WRITE HOW MANY GROUPS ARE BEING ADDED</p>	<p><u>Repeated subtraction</u></p> <p>$24 \div 4 = 6$</p>  <p>1. Subtract 4 until you come to 0 2. Count how many groups of 4 you subtracted</p> <p>ALWAYS WRITE HOW MANY GROUPS ARE SUBTRACTED</p>
It is important that the layout of the grid method <u>TUXU</u> will support the layout of the compact addition method.	<p><u>Grid method</u></p> 	<p><u>Compact method</u></p> <ol style="list-style-type: none"> 1. Make clear links with multiplication by writing a fact box 2. Complete method <p>Fact box</p> <ul style="list-style-type: none"> 4 8 12 16 20 24 28 32 36  <p>Extend to representing the remainder as a decimal or fraction.</p>
Once pupils demonstrate a good understanding of place value and are proficient users of the grid method and number lines to multiply and divide, the compact methods need to be introduced to aid speed and accuracy.	<p><u>Compact methods TUXU and TUXU</u></p> <p>$37 \times 6 = 222$</p> <p>24</p>  	<p>$4 \overline{) 367} \begin{matrix} 091,3 \\ 367 \end{matrix}$</p> <p><u>Long division</u></p> <p>$432 \div 15$ becomes</p>  <p>Answer: 28 remainder 12 Answer: 28 $\frac{4}{5}$ Answer: 28.6</p>