Vocabulary

Number	Addition & Subtraction	Multiplication & Division	Fractions	Measurement	Geometry	Statistics
numeral	altogether	multiply	equivalent	distance apart/ between	parallel/ perpendicular	represent
digits	tens boundary	dividing	numerator	perimeter	line of symmetry	diagram
ones/ tens/ hundreds/ thousands	hundreds boundary	factor	denominator	millimetre/ centimetre/ kilometre	North/East/ South/West	most/least popular
rounding	left over	product	sharing	centigrade	prism	Carroll diagram
approximate	take away	groups of	sixths	a.m/p.m.	vertex	Venn diagram
compare	equivalent	remainder	tenths	earliest/ latest	face	axis
greater than/less than	the same as	column/row	equal parts of a whole	decade/ century	obtuse/ acute angle	frequency
exchange	difference	number pattern	mixed number	Roman numerals	right angle	data

Order for learning the times tables

Step 1 — Fire just 1 x 6, 2 x 6, 5 x 6, 10 x 6 at them first.
This will build up on their most secure existing table facts

Step 2 — Add in 3 x 6, 4 x 6 when step 1 is frequently recalled correctly and instantly
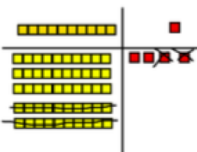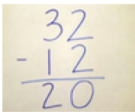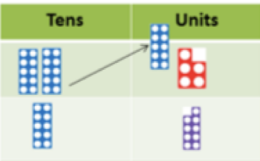
Step 3 — Build up with 6 x 6, 7 x 6, 8 x 6
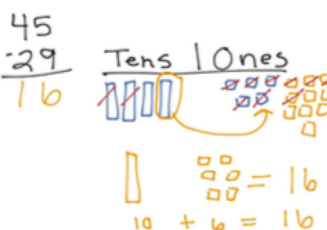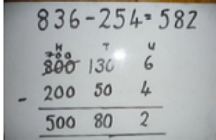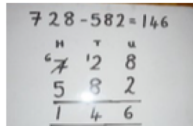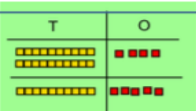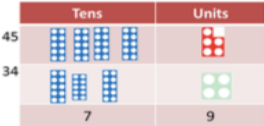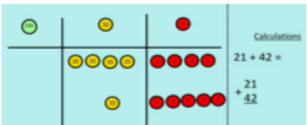
Step 4 — When looking at 9 x 6, 11 x 6 and 12 x 6, children should look at finding 10 x 6 and adjust

When they're ready, add in related division facts.
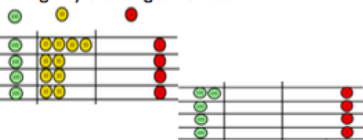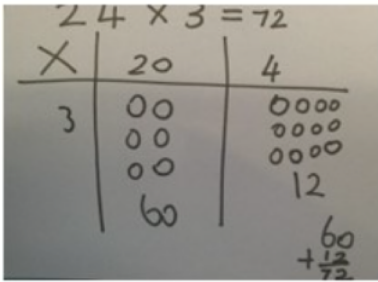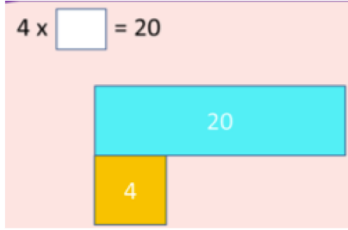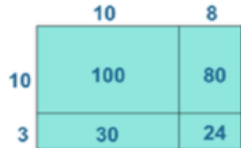
CPA approach to: **Subtraction**

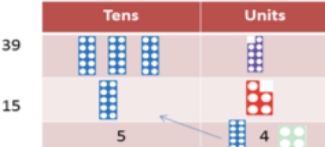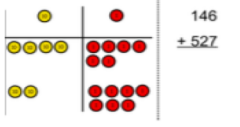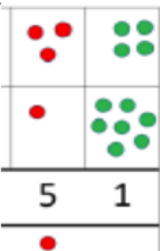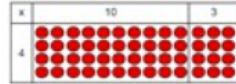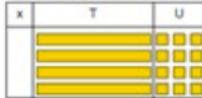| Objective & Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping (friendly numbers)	47—32 Use base 10 or Numicon to model	Darw representations to support understanding	$47 - 24 = 23$ $\begin{array}{r} 40+7 \\ -\ 20+4 \\ \hline 20+3 \end{array}$ Intermediate step may be needed to lead to clear subtraction understanding. $\begin{array}{r} 32 \\ -\ 12 \\ \hline 20 \end{array}$
Column subtraction with regrouping	**Tens** **Units** Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into tten ones. Use the phrase 'take and make' for exchange.	$\begin{array}{r} 45 \\ -29 \\ \hline 16 \end{array}$ Tens	Ones $10 + 6 = 16$ Children may draw base ten or PV counters and cross off.	$836 - 254 = 582$ $\begin{array}{cccc} & 800 & 130 & 6 \\ - & 200 & 50 & 4 \\ \hline & 500 & 80 & 2 \end{array}$ Begin by partitioning into pv columns $728 - 582 = 146$ $\begin{array}{r} 7\ {}^{1}2\ 8 \\ 5\ 8\ 2 \\ \hline 1\ 4\ 6 \end{array}$ Then move to formal method.
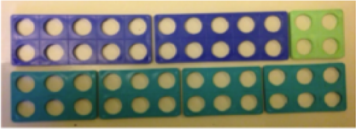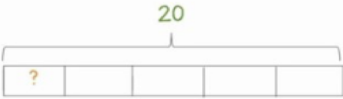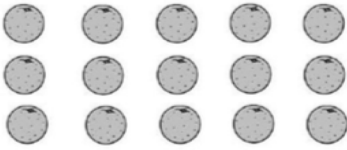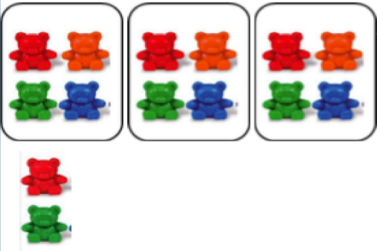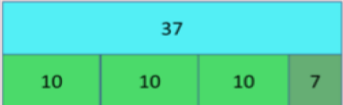
CPA approach to: **Addition**

Objective & Strategy	Concrete	Pictorial	Abstract
Column Addition—no regrouping (friendly numbers) Add two or three 2 or 3-digit numbers.	T O Model using Dienes or numicon Add together the ones first, then the tens. Tens 45, Units 34 7 9 $21 + 42 = $ $\begin{array}{r} 21 \\ +\ 42 \end{array}$ Move to using place value counters	Children move to drawing the counters using a tens and one frame. tens ones	$\begin{array}{r} 2\ 2\ 3 \\ +\ 1\ 1\ 4 \\ \hline 3\ 3\ 7 \end{array}$ Add the ones first, then the tens, then the hundreds.
Column Addition with regrouping.	**Tens** **Units** 39 15 5 4 Exchange ten ones for a ten. Model using numicon and pv counters. 146 + 527	Children can draw a representation of the grid to further support their understanding, carrying the ten **underneath** the line 5 1	$\begin{array}{rcl} 20 & + & 5 \\ 40 & + & 8 \\ 60 & + & 13 & = 73 \end{array}$ Start by partitioning the numbers before formal column to show the exchange. $\begin{array}{r} 536 \\ +\ 85 \\ \hline 621 \\ 1\ 1 \end{array}$

CPA approach to: **Multiplication**

Objective & Strategy	Concrete	Pictorial	Abstract
Grid method	Show the links with arrays to first introduce the grid method. 4 rows of 10 4 rows of 3 Move onto base ten to move towards a more compact method. 4 rows of 13 Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows Calculations 4 x 126 Fill each row with 126 Calculations 4 x 126 Add up each column, starting with the ones making any exchanges needed Then you have your answer.	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below. $24 \times 3 = 72$ Bar model are used to explore missing numbers $4 \times \boxed{} = 20$ 20 4	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. | ×	30	5
7	210	35 | $210 + 35 = 245$ Moving forward, multiply by a 2 digit number showing the different rows within the grid method. |	10	8
10	100	80
3	30	24	

CPA approach to: **Division**

Objective & Strategy	Concrete	Pictorial	Abstract
Division as grouping	Use cubes, counters, objects or place value counters to aid understanding. 24 divided into groups of 6 = 4 96 ÷ 3 = 32	Continue to use bar modelling to aid solving division problems. 20 ? 20 ÷ 5 = ? 5 x ? = 20	How many groups of 6 in 24? 24 ÷ 6 = 4
Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	Draw an array and use lines to split the array into groups to make multiplication and division sentences	Find the inverse of multiplication and division sentences by creating eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4
Division with remainders.	14 ÷ 3 = **Divide objects between groups and see how much is left over**	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder. 0 4 8 12 13 Draw dots and group them to divide an amount and clearly show a remainder. remainder 2 Use bar models to show division with remainders. 37 10 10 10 7 Example without remainder: 40 ÷ 5 Ask "How many 5s in 40?" 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 8 fives 0 5 10 15 20 25 30 35 40 Example with remainder: 38 ÷ 6 6 + 6 + 6 + 6 + 6 + 6 + 2 = 6 sixes with a remainder of 2 0 6 12 18 24 30 36 38 For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.	Complete written divisions and show the remainder using r. 29 ÷ 8 = 3 REMAINDER 5 ↑ ↑ ↑ ↑ dividend divisor quotient remainder