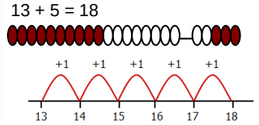
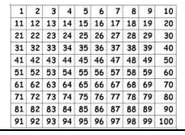
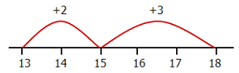
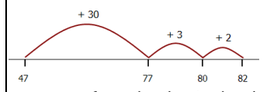
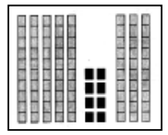
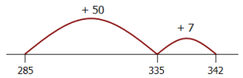
ADDITION

	STATUTORY EXPECTATIONS	Practical or recorded using ICT.	Pictures/Objects	Symbolic	Manipulatives/ concrete objects
YR	Count … from 1-20 … and say which no. is 1 more than a given no. Using quantities objects, + two U nos and count on to find the answer. [Expected] Estimate no. of objects; check quantities by counting up to 20. [Exceeding]	Hannah … listed how many girls and how many boys were outside. [She] was able to say that "There are 5 girls and 4 boys. That's 9 altogether". When playing in the shop Christopher used his shopping list to add 2 amounts. He said "the beans are 5 pence and the bananas are 3 pence, altogether that is 8 pence." [EYFS Profile exemplifications, STA]	I eat 2 cakes and my friend eats 3. How many cakes did we eat altogether? Might be recorded as: *2 + 3 = 5* 	8 people are on the bus. 5 more get on at the next stop. How many people are on the bus now [Might be recorded as: *8 + 5 = 13*]	Straws Cubes Concrete objects (compare bears etc) Teacher beadstring/bar

Y1	Add (and subtract) one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero Read/write/interpret statements involving addition (+), subtraction (-) and equals (=) signs.	Pupils use concrete objects and pictorial representations	Practical/recorded using ICT Pictures/Symbolic (*see above*)	Visual (modelled using bead strings) 13 + 5 = 18  Using drywipe numberlines	Count on using a 100 square 	Visual (efficient jumps) 13 + 5 = 18 [jumps may be in 1s]  Using dry wipe number lines or blank number lines	Straws Cubes Concrete objects (compare bears etc) Beadstrings Numberlines (drywipe)

Y2	**TU + U** **TU + tens** **TU + TU** **U + U + U** [Show addition of two numbers can be done in any order.]	Recognise/use inverse relationship between +/- and use to check calcs and missing number problems. Pupils use concrete objects, pictorial representations and **mental strategies**.	Visual (efficient jumps) 35 + 47= 82  [Also jumps can be in 10s and 1s] Using empty numberlines – progress from drywipe to drawing their own	Practical/visual images 58 + 30 = 88 	Partitioning 35 + 47 = 82 40 + 30 = 70 7 + 5 = 12 Linear recording	*Partitioning could be extended to recording addition in columns which supports place value and prepares for formal written methods with larger numbers. (Higher ability children).* 47 + 35 = 82 40 + 7 30 + 5 70 + 12	Straws Cubes Empty numberlines Dienes

Y3	Use **formal** written methods of **columnar addition**. **TU + TU** **HTU + TU** **HTU + HTU**	Number line 57 + 285 = 342  	No number line 57 + 285 = 342 285 + 50 = 335 335 + 7 = 342	**Expanded** vertical 374 + 248 12 110 500 622 • Teacher modelling • Use manipulatives (dienes) • Children not to focus on recording expanded method • Teacher to demonstrate strong link to compact method	**Compact** vertical + 2 3 5 2 9 6 1 1 5 5 1 Only move to compact method when children are secure in their understanding of the place value of the numbers.		Empty numbelines (writing own) Dienes

Y4	Use **formal** written methods of **columnar addition**. **HTU + HTU** **ThHTU + HTU** **ThHTU + ThHTU**	**Expanded** vertical 789 + 642 = 1431 789 + 642 11 120 1300 1431 • Teacher modelling • Use manipulatives (dienes) • Children not to focus on recording expanded method • Teacher to demonstrate strong link to compact method		**Compact** vertical 635 + 896 = 1551 + 6 3 5 8 9 6 1 1 1 5 5 1	**Expanded** vertical 5735 + 562 = 5735 + 562 7 90 1200 5000 6297 6297	**Compact** vertical 5735 + 562 = 6297 5735 + 562 1 6297	Dienes

Y5	Add whole numbers >4 digits, including using **formal** written methods (**columnar addition**). Decimals up to 2dp (eg 72.5 + 45.7)	**Expanded** vertical 23.70 + 48.56 0.06 1.20 11.00 60.00 72.26 Teacher modelling Use manipulatives (dienes/place value counters) Children not to focus on recording expanded method Teacher to demonstrate strong link to compact method		**Compact** vertical 23.70 + 48.56 1 1 72.26	Dienes (with decimals) Place Value counters

Y6	Solve multi-step problems in contexts, deciding which operations/methods to use and why. Decimals up to 3dp (Context: Measures)	**Expanded** vertical (This method may only be used with lower ability children) 3.243 + 18.070 = **21.313** 3.243 + 18.070 0.003 0.110 0.200 21.000 Teacher modelling Use manipulatives (dienes/place value counters) Children not to focus on recording expanded method Teacher to demonstrate strong link to compact method		**Compact** vertical 3.243 + 18.070 1 1 21.313	Dienes (with decimals) Place Value counters

SUBTRACTION

STATUTORY EXPECTATIONS

Manipulatives/concrete objects

YR

Count … from 1-20 … and say which no. is 1 less than a given no. Using quantities objects, subtract two U nos and count back to find the answer. [Expected] Estimate no. of objects; check quantities by counting up to 20. [Exceeding]

Practical or recorded using ICT.

Chloe was playing in the maths area. "I need three more" she said as she added some cubes to the circle. She then realised she had more than her friend. "Oh, I have too many". She removed one. "Now we have the same".

During a game of skittles outdoors Joseph knocked three numbered skittles down. He was able to calculate his score in his head.

[EYFS Profile exemplifications, STA]

Pictures/Objects

I have five cakes. I eat two of them. How many do I have left?

Might be recorded as: *5 – 2 = 3*

Symbolic

Mum baked 9 biscuits. I ate 5. How many were left?

[Might be recorded as: *9 – 5 = 4]*

Counting back (efficient jumps)

With, or without, number line (using known facts)

11 - 1 = 10
10 – 2 = 8

Straws
Cubes
Concrete objects (compare bears etc)
Teacher beadstring/bar

Y1

Subtract (and add) one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero

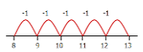
Read/write/interpret statements involving addition (+), subtraction (-) and equals (=) signs

Practical or recorded using ICT.

Pupils use concrete objects and pictorial representations (eg place value counters, Dienes)

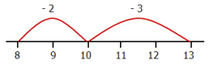
Taking away – jumps of 1 (modelled using bead strings)

13 – 5 =8



Using drywipe number lines

Taking away (efficient jumps) 13 – 5 = 8

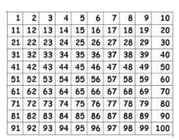


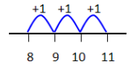
Using drywipe numberlines

No number line – using known facts:

13 – 3 = 10
10 – 2 = 8

Counting on – jumps of 1





Taking away on a blank number line

Straws
Cubes
Concrete objects (compare bears etc)
Beadstrings
Numberlines (drywipe)

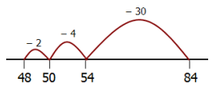
Y2

TU - U
TU - tens
TU - TU

[Show subtraction of two numbers cannot be done in any order.]

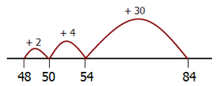
Pupils use concrete objects and pictorial representations and **mental strategies** (eg place value counters, Dienes)

Taking away 84 - 36 = 48



[Also jumps can be in 10s/1s]
Using empty numberlines – progress from drywipe to drawing their own

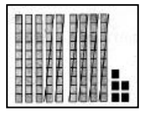
Counting on 84 - 48 = 36



[Also jumps can be in 10s/1s]
Using empty numberlines – progress from drywipe to drawing their own

Practical/visual images

95 - 60 = 35



Recording subtraction in columns supports place value and prepares for formal written methods with larger numbers.

98 - 35 = 63

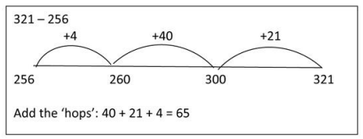
90 and 8
30 and 5
60 and 3

Straws
Cubes
Empty numberlines
Dienes

Y3

Use **formal** written methods of **columnar addition**

TU - TU
HTU - TU
HTU - HTU



Counting on

Taking away (no number line)

326 - 178 = 148
326 - 100 = 226
226 - 70 = 156
150 - 2 = 148

Model subtraction using dienes (begin with subtractions that don't require decomposition and then move on to decomposition).

Expanded (no decomposition)

	800	70	4
-	500	20	3
	300	50	1

874 - 523 = 351

	8	7	4
–	5	2	3
	3	5	1

(no decomposition)

Decomposition

932 - 457 = 475

	8	12	1
	9	3	2
–	4	5	7
	4	7	5

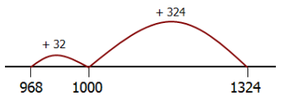
Empty numbelines (writing own)
Dienes

Y4

Use **formal** written methods of **columnar subtraction**.

HTU - HTU
ThHTU - TU
ThHTU - HTU
ThHTU - ThHTU

Counting on 1324 - 968 = 356



Decomposition: 1374 - 968 = 406
(model with dienes)

	1000	300	70	4
-		900	60	8
	1300	60	14	
-		900	60	8
	400	0	6	

Decomposition
1374 - 968 = 406

	6		
	1	3	7 4
–	9	6	8
	4	0	6

Dienes

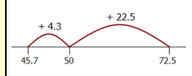
Y5

Subtract whole numbers >4 digits, including using **formal** methods (**columnar subtraction**).

Decimals up to 2dp (eg 72.5 - 45.7)

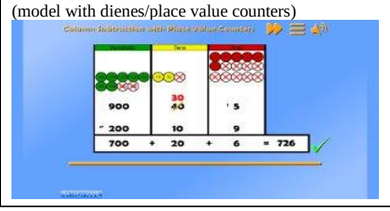
Counting on

72.5 – 45.7 = 26.8



Doesn't need to be taught, but might be useful for LA.

Decomposition
(model with dienes/place value counters)



Decomposition
1374 - 968 = 406

	6		
	1	3	7 4
–	9	6	8
	4	0	6

Decomposition

72.5 - 45.7 = 26.8

	5	11	15
	~~7~~	~~2~~	~~.5~~
–	4	5	.7
	2	6	.8

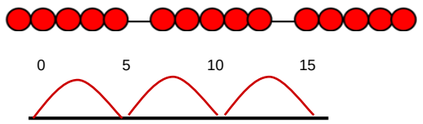
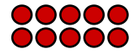
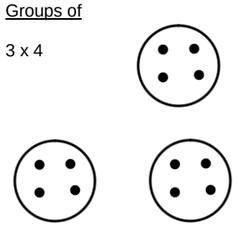
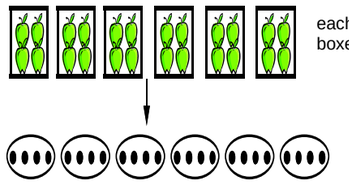
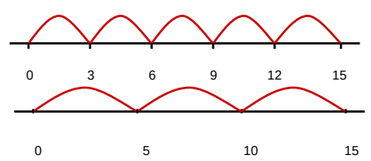
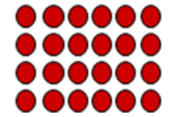
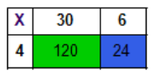
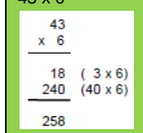
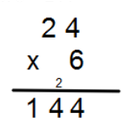
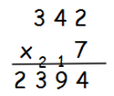
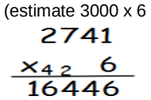
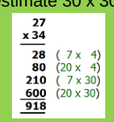
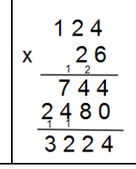
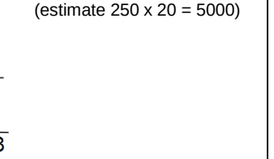
Dienes (with decimals)
Place Value counters

Y6

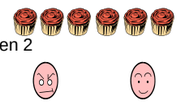
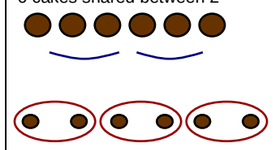
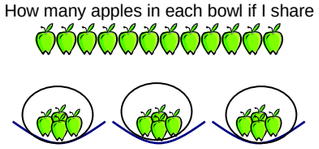
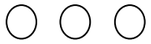
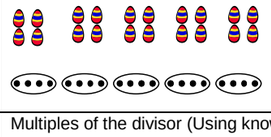
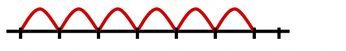
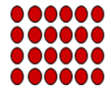
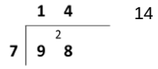
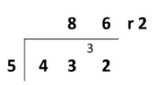
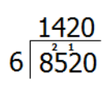
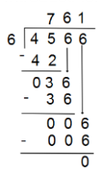
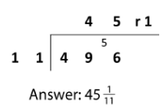
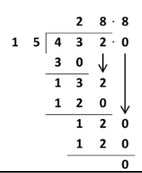
Solve multi-step problems in contexts, deciding which operations/methods to use and why. Decimals up to 3dp (Context: Measures)

See previous years

MULTIPLICATION

	STATUTORY REQUIREMENTS					Manipulatives/concrete equipment
YR	Children … solve problems, including doubling, halving and sharing. [Expected] Solve practical problems that involve combining groups of 2/5/10. [Exceeding]	Practical/ recorded using ICT (eg digital photos / pictures on IWB) This domino is a double 4. How many spots does it have?	Pictures/Objects How many socks in three pairs? 	Symbolic 3 pairs, 2 socks in each pair: You can draw sticks or dots as a representation.		Counting stick Concrete objects (eg socks, gloves etc)
Y1	Solve one-step problems using concrete objects, pictorial representations and arrays *(with the support of the teacher)*	Practical/recorded using ICT Pictures/Symbolic There are five cakes in each bag. How many cakes are there in three bags? 	Visual (eg modelled using bead strings) **5** x 3 **or** 3 x **5** [two, three times] or [three groups of two] 	<u>Arrays</u> 5 x 2 or 2 x 5  Use counters or pegboards	<u>Groups of</u> 3 x 4 	Counting sticks Concrete examples of arrays (cake tins, egg boxes etc) Counters Double sided counters
Y2	Calculate statements for multiplication within the multiplication tables and write them using the multiplication and equals signs. [Show multiplication of two numbers can be done in any order.] U x U x U	Pictures/Symbolic There are four apples in each box. How many apples in six boxes 	Repeated addition 5 x 3 or 3 x 5 	Arrays 6 x 4 or 4 x 6 	Split multiplication 12 x 5 = 10 x 5 = 2 x 5 =	Counting sticks Concrete examples of arrays (cake tins, egg boxes etc) Counters Double sided counters
Y3	Write/calculate statements using the multiplication tables that they know (progressing to **formal** written methods). **TU x U** (multiplier is 2/3/4/5/8/10)	GRID Estimate answer first 36 x 4 = 144 	**Partitioned** 36 x 4 = 144 30 x 4 = 120 6 x 4 = 24	Compact Estimate answer first. 36 x 4 = 144 	*Pupils develop reliable written methods for multiplication, starting with calculations of TU by U (progressing to formal written methods of short multiplication).*	Counting stick Dienes
Y4	Use **formal** written layout: **TU x U** **HTU x U** Convert between different units of measure [eg km to m; hr to mi]	Partitioned 43 x 6 = 258 (estimate: 40 x 6 = 240) 40 x 6 = 240 3 x 6 = 18	Expanded 43 x 6 	**Compact** 24 x 6 = 144  Carry numbers on top of the line.	Expanded **237 × 4** (estimate: 250 × 4 = 1000) 237 × 4 28 120 800 948	Compact 342 x 7 = 2394 	Counting stick Dienes
Y5	Use a **formal** written method (including long x for TU nos) **TU x TU** **HTU x U / HTU x TU** **ThHTU x U** Convert between units of measure (eg km/m; m/cm; cm/mm; kg/g; litre and ml)	Compact 2741 x 6 = 16446 (estimate 3000 x 6 = 18000 	Expanded 27 x 34 = 918 (estimate 30 x 30 = 900) 	Compact 24 x 16 = 384 (estimate 25 x 15 = 375)	Compact 124 x 26 = 3224 	Estimate first [see Y6 – demonstrating commutativity]	Counting stick
Y6	Multi-digit numbers (up to 4 digits) x TU whole number using the **formal** method of **long multiplication**. Multiply one-digit numbers with up to two decimal places by whole numbers	Compact 256 x 18 = 4608 (estimate 250 x 20 = 5000) 	Compact 124 x 26 = 3224 [NB See Y5 method – demonstrating commutativity]	Compact 4.7 x 8 = 37.6 (estimate 5 x 8 = 40) [Or 47 x 8, then divide the solution by 10.]		Counting stick

DIVISION

STATUTORY EXPECTATIONS							Manipulatives/concrete equipment
YR	Children … solve problems, including doubling, halving and sharing. [Expected] They solve practical problems that involve sharing into equal groups. [Exceeding]	Practical / recorded using ICT (eg digital photos/pictures on IWB)	Pictures/Objects 6 cakes shared between 2  6 cakes put into groups of 2 	Symbolic 6 cakes shared between 2 	There are 8 raisins. Take half of them. How many do you have? Share the 10 grapes between 2 people.	Division number sentence 6 ÷ 2 = 5 	Concrete equipment (compare bears, fruit etc)
Y1	Solve one-step problems using concrete objects, pictorial representations and arrays *(with the support of the teacher)* *Focus on practical division, no need to use symbol.*	Practical/recorded using ICT There are 14 people on the bus. Half of them get off. How many remain on the bus? There are 20 people in the class. One quarter are boys. How many boys are there?	Pictures/Symbolic How many apples in each bowl if I share 12 apples between 3 bowls? 	Sharing Sharing cubes into circle s 	Arrays (modelled by teacher) 15 ÷ 5 = 3 		Concrete equipment (compare bears, fruit etc) Concrete arrays Beadstrings
Y2	Calculate statements within the multiplication tables and write them using the division and equals signs. [Show division of two numbers cannot be done in any order.] Find ⅓, ¼, ¾, ¾ of a length/objects/quantity. Write simple fractions eg ½ of 6 = 3	Pictures/Symbolic Four eggs fit in a box. How many boxes would you need to pack 20 eggs? 	Visual (modelled using bead strings) 18 ÷ 3 = 6  0 3 6 9 12 15 18	Arrays Find ¼ of 24 24 ÷ 4 = 6 	Partitioning (using known facts from 2, 5 and 10 times table) 32 ÷ 2 = 16 20 ÷ 2 = 10 12 ÷ 2 = 6		Beadstrings Concrete arrays counters
Y3	Write/calculate statements using the tables that they know (progressing to **formal** written methods). **TU ÷ U** (divisor is 2/3/4/5/8/10)	Multiples of the divisor (Using known multiplication facts and multiples of those facts) 85 ÷ 5 = 17 10 x 5 = 50 7 x 5 = 35	Using manipulative for division Using dienes and place value counters to complete divisions. Exchanging when necessary.	Compact method (Teach in parallel with chunking) 51 ÷ 3 = 17 			Dienes Use place value counters
Y4	*Pupils practise to become fluent in the **formal** written method of **short division** with exact answers [NS]* **TU ÷ U; HTU ÷ U**	Multiples of the divisor 98 ÷ 7 = 14 10 x 7 = 70 4 x 7 = 28	Using manipulative for division Using dienes and place value counters to complete divisions. Exchanging when necessary.	Compact method 98 ÷ 7 =  14	Compact method 252 ÷ 7 = 36 		Dienes Place value counters
Y5	Use the **formal** written method of **short division** (interpret remainders appropriately for the context). **HTU ÷ U** **ThHTU ÷ U** Convert between units of measure (eg km/m; m/cm; cm/mm; kg/g; litre and ml)	Compact method (with remainders) 432 ÷ 5 = 86 r2 (estimate: 400 ÷ 5 = 80) 	Using manipulative for division Using dienes and place value counters to complete divisions. Exchanging when necessary.	8520 ÷ 6 = 1420 	Introduce long division 		Dienes Place Value Counters
Y6	Divide numbers (up to 4 digits) by TU whole number using the **formal** method of **short/long division** (interpret as approp. for the context). Use written division methods in cases where the ans has up to 2dp. *[Divide numbers up to 2dp by U/TU whole numbers.]*	Partitioning 43.4 ÷ 7 = 6.2 (estimate 42 ÷ 7 = 6) 6 x 7 = 42 0.2 x 7 = 1.4	Compact method 43.68 ÷ 7 = 6.24 (estimate: 42 ÷ 7 = 6) [Or compute 4368 ÷ 7, then divide the solution by 100.] 	Compact method (remainder as a fraction) 496 ÷ 11 (estimate 500 ÷ 10 = 50)  Answer: $45\frac{1}{11}$	Long division (compact method) 432÷ 15 = 28.8 		Place Value Counters