



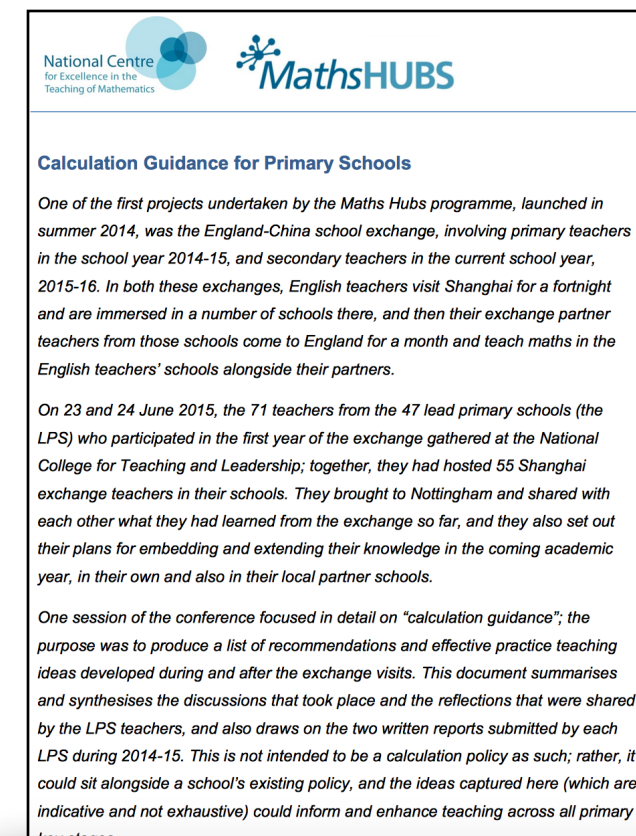
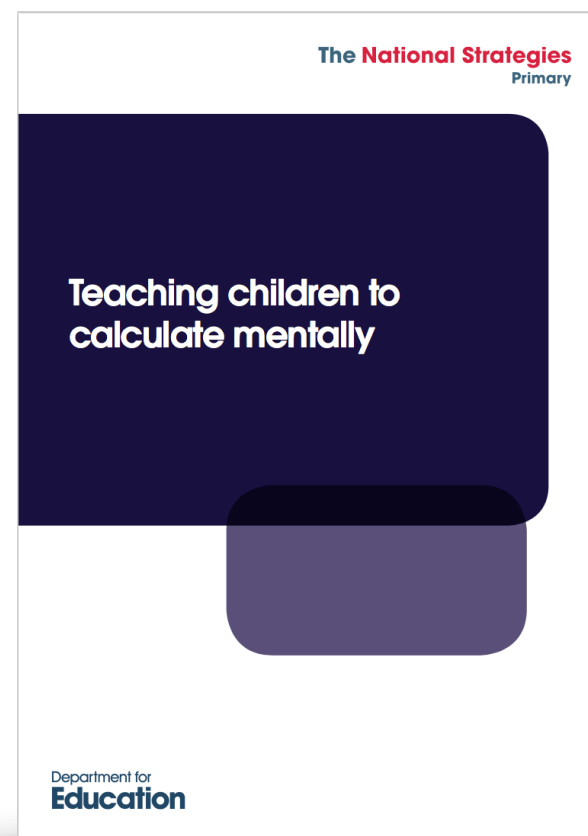
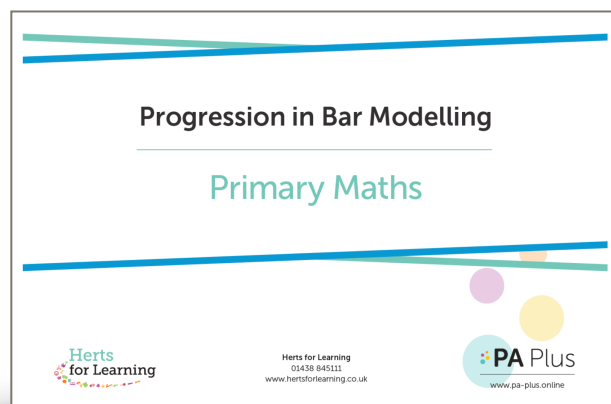
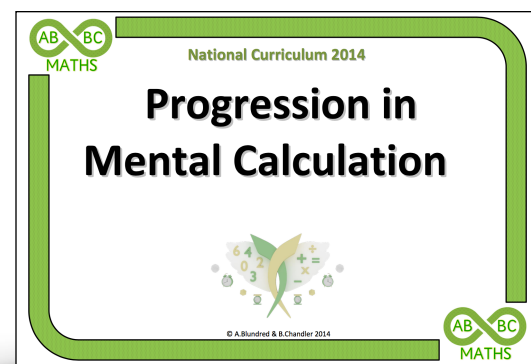
Bader Mental Calculation Policy

This policy details the expectations and standards for mental calculation. This involves developing a strong understanding of place value and the manipulation of number.

There are four pillars to teaching mental calculation: place value, number facts, images and models, and doubling and halving.

- *Understanding how the number system works supports children to understand how numbers are related to each other.*
- *Recall of number facts supports all areas of maths by reducing demand on working memory.*
- *Images and models support conceptual understanding and making connections, which in turn develops reasoning.*
- *Doubling and halving develops children's multiplicative reasoning.*

Daily counting and number work is vital to children's mathematical development. Teachers should plan daily sessions to introduce, revise or practise mental strategies. Mental/ Number objectives may or may not be linked to the main part of the lesson. The requirement is that all children are taught age-appropriate strategies and have experience in all strategies across each term. This should provide a good opportunity to revise strategies across the year. Teachers should refer to the four documents shown below to inform pitch, content and expectations in mental work. The progressions for each strategy, taken from the 'Teaching children to calculate mentally' document, are listed in this policy.





COUNTING

Daily counting is an important part of all children's mathematical education. All year groups should practise counting using a counting stick.

The counting stick is a representation of an empty number line and is separated into ten sections. By counting from one end to another, it represents eleven steps, so patterns such as those which occur when counting in steps of 0.1 can be observed. Children should count forwards and backwards in age-appropriate steps.

Post-it notes or stickers may be used to demarcate numbers when teaching a sequence, and removed to aid memorisation and recall. Once the counting stick has been used, children might practise counting on a number line or hundred square to reinforce the learning.

Teachers lead the whole-class counting session. As children become more familiar with the resource, they will learn to understand some important relationships between numbers. This will support the learning of times tables and multiplicative reasoning more generally.

For example, children will learn:

- the tenth step is ten times bigger than the first step
- the half way point is half of the tenth step, and five times the first step
- the eighth step is double the fourth step which is double the second step which is double the first step
- the sixth step is double the third step
- the ninth step is one less than the tenth step



Children might also be encouraged to make conjectures about where other numbers would lie in relation to the known amounts. For example, if the stick represented 1000ml, where would 730ml be found?

DIFFERENT WAYS OF COUNTING

Single steps	Multiples	Use a rule eg $10 + 1 - 3$	Missing numbers	Odds or evens
Fractions	Units of time	Millilitres/litres	Centimetres/metres	Decimals
Grams/kilograms	Negative numbers / Temperature	Percentages	Ordinals	Money

VISUAL AIDS FOR COUNTING

Number line	100 square	Counting beads	Bead frame	Objects
Number snake	Number tiles	Pocket number line	Real money, large money or magnetic money	Shapes eg count sides
Counting stick	Whiteboards making own visual prompt	Objects (real life)	Base 10 Hundreds, tens, units	Groups of straws
Real life packaging showing arrays eg egg boxes, biscuit packets	Wrapping paper, wall paper etc. to count number of shapes	Number track	Counting bead string	Tape measure or metre stick
Clocks	Measuring jugs	Thermometer	Bead frame/abacus	Calculator
Pictures	Fingers	Interactive whiteboard	Multilink/buttons etc.	Number cards



Children should have a daily session focused on counting and developing mental calculation. Teachers should plan the content of each session based on the needs of the children.

What are the different aspects of mental calculations?

This section has emphasised that mental calculation is more than just recalling number facts, but this is an important skill that helps children to concentrate on their calculations, the problems and the methods involved. Below are six aspects of mathematics that involve mental calculation. They are supported with questions to exemplify what might be asked of children to engage them in mental calculation activity and to stimulate discussion.

Recalling facts

- What is 3 add 7?
- What is 6×9 ?
- How many days are there in a week?... in four weeks?
- What fraction is equivalent to 0.25?
- How many minutes in an hour, in six hours?

Applying facts

- Tell me two numbers that have a difference of 12.
- If 3×8 is 24, what is 6×0.8 ?
- What is 20% of £30?
- What are the factors of 42?
- What is the remainder when 31 is divided by 4?

Hypothesising or predicting

- The number 6 is $1 + 2 + 3$, the number 13 is $6 + 7$. Which numbers to 20 are the sum of consecutive numbers?
- Roughly, what is 51 times 47?
- How many rectangles in the next diagram? And the next?
- On a 1 to 9 key pad, does each row, column and diagonal sum to a number that is a multiple of 3?



Designing and comparing procedures

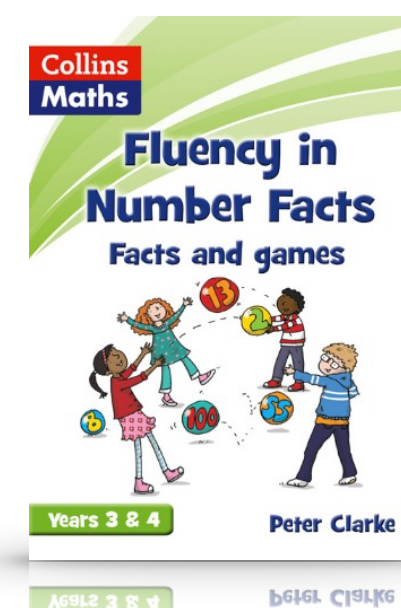
- How might we count a pile of sticks?
- How could you subtract 37 from 82?
- How could we test a number to see if it is divisible by 6?
- How could we find 20% of a quantity?
- Are these all equivalent calculations: $34 - 19$; $24 - 9$; $45 - 30$; $33 - 20$; $30 - 15$?

Interpreting results

- So what does that tell us about numbers that end in 5 or 0?
- Double 15 and double again; now divide your answer by 4. What do you notice? Will this always work?
- If $6 \times 7 = 42$ is $60 \times 0.7 = 42$?
- I know 5% of a length is 2 cm. What other percentages can we work out quickly?

Applying reasoning

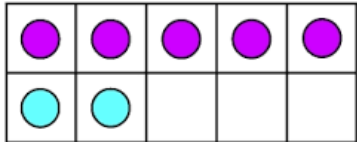
- The seven coins in my purse total 23p. What could they be?
- In how many different ways can four children sit at a round table?
- Why is the sum of two odd numbers always even?



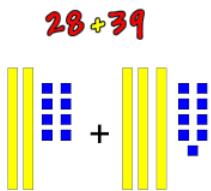
When appropriate, children might practise recall or strategies through games.



Young children should understand the “ten-ness” of ten through the use of ten frames. These support fluency in number facts to 5, 10 and then 20. **The step where the tens boundary is crossed is critical in children developing the concept of exchange.** Ten frames also support the concept of place value in two digit numbers. From this point, children should start to see ten lots of one being equivalent to one lot of ten.



From ten frames, children should move to representing numbers using corresponding amounts of base-10 blocks and then using place value cards.



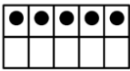
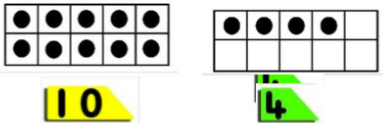
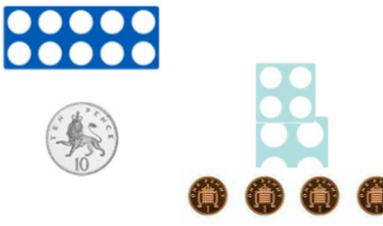
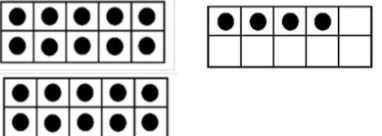
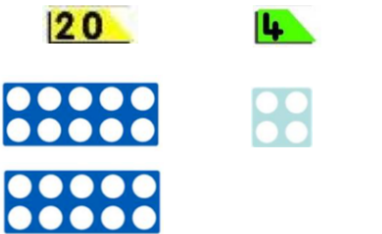
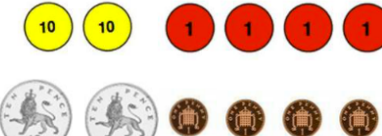
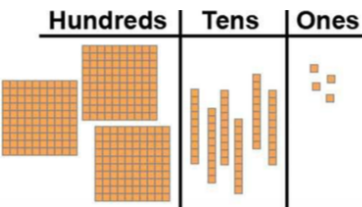
Once children are secure with base-10 blocks and place value cards, they should be introduced to place value counters. These are more abstract in nature but are necessary for when children come to represent larger numbers. Alongside place value cards, they will support children’s partitioning of larger numbers.

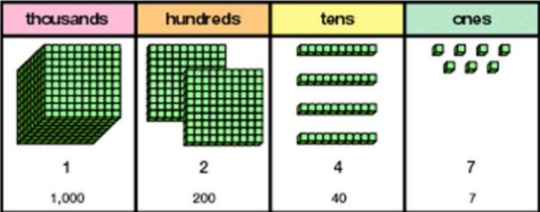
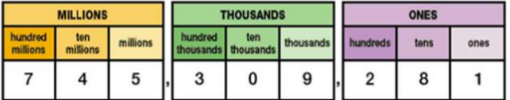
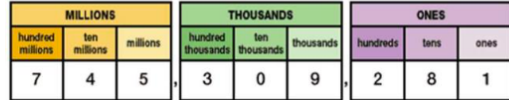


Children should use place value for the following types of calculations:

- Y1: $3 + 8 = 8 + 2 + 1$
- Y2: $25 + 38 = 20 + 30 + 5 + 5 + 3$
- Y3: $354 - 80$ (35 tens - 8 tens = 27 tens)
- Y4: $1375 - 40$
- Y5: $19142 + 7500$
- Y6: $269\,000 - 72\,000$

PLACE VALUE

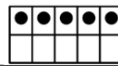
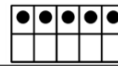
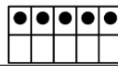
Progression in the teaching of place value			
Foundation	Year 1	Year 2	Year 3 onwards
Understanding ten	Understanding numbers up to 20	Understanding numbers up to one hundred	Understanding numbers up to one thousand
A TENS FRAME is a simple maths tool that helps children: • Keep track of counting • See number relationships • Learn addition to 10 • Understand place value Use tens frames flash cards daily to ensure children recognise amounts. Use empty tens frames to fill with counters to enable children to understand number relationships. Either fill the tens frame in pairs or in rows. In rows shows 5 as a benchmark. Children can easily see more than 5 or less.  Setting the counters in pairs, naturally allows the children to see addition concepts.  Include other visual images such as dice, cards, dominoes etc.	'Ten' is the building block of our Base 10 numeration system. Young children can usually 'read' two-digit numbers long before they understand the effect the placement of each digit has on its numerical value. A child might be able to correctly read 62 as sixty-two and 26 as twenty-six, and even know which number is larger, without understanding why the numbers are of differing values. Ten-frames can provide a first step into understanding two-digit numbers simply by the introduction of a second frame. Placing the second frame to the right of the first frame, and later introducing numeral cards, will further assist the development of place-value understanding.  	Continue developing place value through the use of tens frames.    	Continue developing place value through the use of manipulatives.   Use Dienes blocks and place value charts 

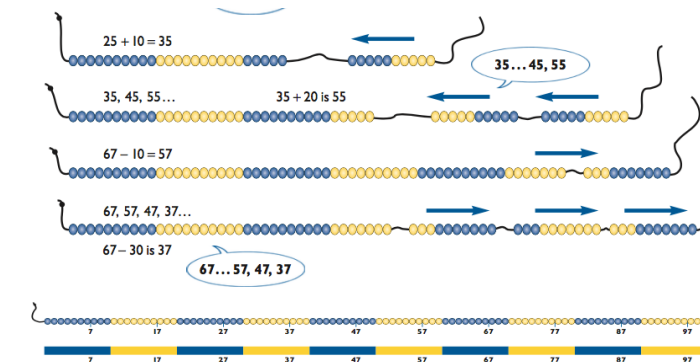
Progression in the teaching of place value		
Year 4	Year 5	Year 6
Understanding numbers up to ten thousand	Understanding numbers up to one million including decimals	Understanding numbers beyond one million including decimals
Continue developing place value through the use of manipulatives. • Place value arrow cards • Place value counters • Dienes blocks • Place value charts 	Continue developing place value through the use of manipulatives. • Place value arrow cards • Place value counters (including decimal counters) • Dienes blocks • Place value charts 	Continue developing place value through the use of manipulatives. • Place value arrow cards • Place value counters (including decimal counters) • Dienes blocks • Place value charts 



CONCEPTUAL VARIATION

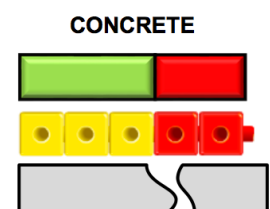
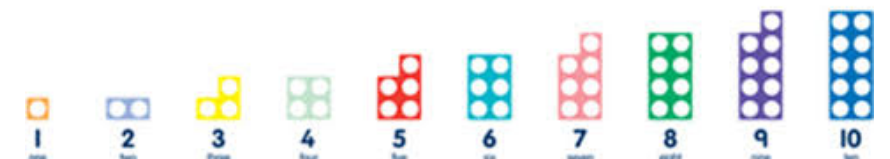
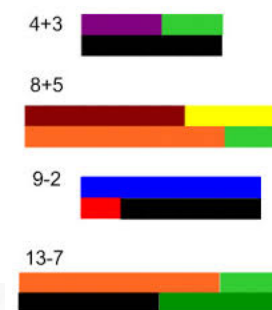
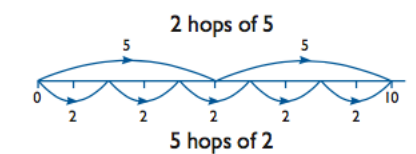
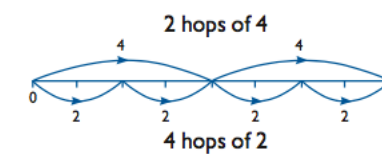
“All children, from Foundation to Year 6, should have access to concrete manipulatives and should experience concepts with a variety of representations”

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Real-life objects	Real-life objects	Real-life objects	Real-life objects	Real-life objects	Real-life objects	Real-life objects
0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards
Number track to 10	Number line to 20	Number line to 100	Number line to 100	Number line including negative numbers	Number line including negative numbers	Number line including negative numbers
Numbered counting stick	Counting stick	Counting stick	Counting stick	Counting stick	Counting stick	Counting stick
Tens frame 	Tens frame 	Tens frame 				
	Place value charts – Tens and ones	Place value charts – Hundreds, tens and ones	Place value charts – Thousands, hundreds, tens and ones	Place value charts – Ten thousands, thousands, hundreds, tens, ones and tenths	Place value charts to a million and three decimal places	Place value charts to 10 million and three decimal places
Interlocking cubes - Use one colour to represent one amount	Interlocking cubes - Use one colour to represent one amount	Dienes	Dienes	Dienes	Dienes	Dienes
	Place value arrow cards – tens and ones	Place value arrow cards – tens and ones	Place value counters	Place value counters	Place value counters	Place value counters
Part-part-whole mat	Part-part-whole mat	Part-part-whole mat	Place value arrow cards – H, T, O	Place value arrow cards – Th, H, T, O	Place value arrow cards	Place value arrow cards
Bar model with real-life objects	Bar model with real life objects/pictorial objects/representative objects eg. counters	Bar model with counters /Dienes progressing to numbers	Part-part-whole model	Part-part-whole model	Part-part-whole model	Part-part-whole model
Bar model with numbers	Bar model with numbers	Bar model with numbers	Bar model with numbers	Bar model with numbers	Bar model with numbers	Bar model with numbers
Bead strings – ten	Bead strings – twenty	Bead strings – hundred	Bead strings – hundred	Bead strings – hundred	Bead strings – hundred	Bead strings – hundred
Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes
			Cuisenaire rods	Cuisenaire rods	Cuisenaire rods	Cuisenaire rods
Double sided counters	Double sided counters	Double sided counters	Double sided counters	Double sided counters	Double sided counters	Double sided counters
Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount

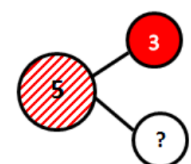


1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

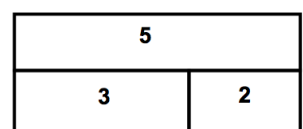
$2 \times 4 = 8$
 $4 \times 2 = 8$



CONCRETE

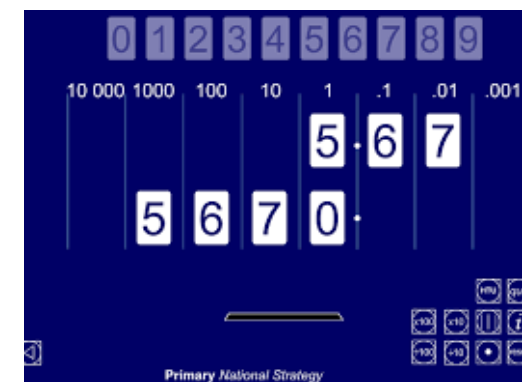
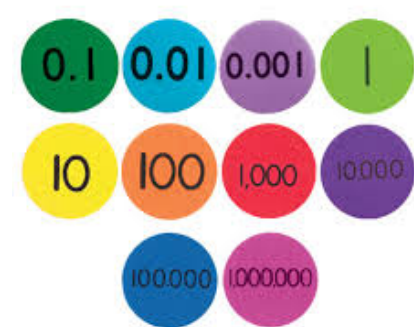
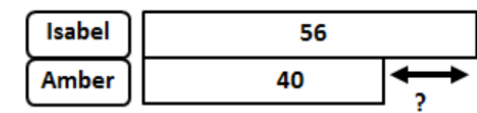
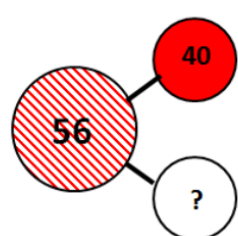


PICTORIAL



ABSTRACT

I know that 2 and three more is equal to 5.
 $5 = 3 + 2$





Counting forwards and backwards

Examples of expectations over Years 1 to 6

	Example calculations	Possible counting strategy
Year 1	$4 + 5$	count on in ones from 4 (or in ones from 5)
	$8 - 3$	count back in ones from 8
	$10 + 7$	count on in ones from 10 (or use place value)
	$13 + 5$	count on in ones from 13
	$17 - 3$	count back in ones from 17
	$18 - 6$	count back in twos
Year 2	$23 + 5$	count on in ones from 23
	$57 - 3$	count back in ones from 57
	$60 + 5$	count on in ones from 60 (or use place value)
	$80 - 7$	count back in ones from 80 (or use knowledge of number facts to 10 and place value)
	$27 + 60$	count on in tens from 27
	$72 - 50$	count back in tens from 72
Year 3	$50 + 38$	count on in tens then ones from 50
	$90 - 27$	count back in tens then ones from 90
	$34 + 65$	count on in tens then ones from 34
	$87 - 23$	count back in tens then ones from 87
	$35 + 15$	count on in steps of 5 from 35
Year 4	$73 - 68$	count up from 68, counting 2 to 70 then 3 to 73
	$47 + 58$	count on 50 from 47, then 3 to 100, then 5 to 105
	$124 - 47$	count back 40 from 124, then 4 to 80, then 3 to 77
	$570 + 300$	count on in hundreds from 570
	$960 - 500$	count back in hundreds from 960
Year 5	$3.2 + 0.6$	count on in tenths
Year 6	$1.7 + 0.55$	count on in tenths and hundredths

Reordering

Examples of expectations over Years 1 to 6

	Example calculations	Possible reordering strategy
Year 1	$2 + 7$	$7 + 2$
	$5 + 13$	$13 + 5$
	$10 + 2 + 10$	$10 + 10 + 2$
Year 2	$5 + 34$	$34 + 5$
	$5 + 7 + 5$	$5 + 5 + 7$
Year 3	$23 + 54$	$54 + 23$
	$12 - 7 - 2$	$12 - 2 - 7$
	$13 + 21 + 13$	$13 + 13 + 21$ (using double 13)
Year 4	$6 + 13 + 4 + 3$	$6 + 4 + 13 + 3$
	$17 + 9 - 7$	$17 - 7 + 9$
	$28 + 75$	$75 + 28$ (thinking of 28 as 25 + 3)
Year 5	$12 + 17 + 8 + 3$	$12 + 8 + 17 + 3$
	$25 + 36 + 75$	$25 + 75 + 36$
	$58 + 47 - 38$	$58 - 38 + 47$
	$200 + 567$	$567 + 200$
	$1.7 + 2.8 + 0.3$	$1.7 + 0.3 + 2.8$
Year 6	$3 + 8 + 7 + 6 + 2$	$3 + 7 + 8 + 2 + 6$
	$34 + 27 + 46$	$34 + 46 + 27$
	$180 + 650$	$650 + 180$ (thinking of 180 as 150 + 30)
	$1.7 + 2.8 + 0.3$	$1.7 + 0.3 + 2.8$
	$4.7 + 5.6 - 0.7$	$4.7 - 0.7 + 5.6 = 4 + 5.6$



Partitioning: compensating

Examples of expectations over Years 2 to 6

	Example calculations	Possible compensation strategy
Year 2	$34 + 9$ $34 + 19$ $34 + 29$ and so on	$34 + 10 - 1$ $34 + 20 - 1$ $34 + 30 - 1$ and so on
	$34 + 11$ $34 + 21$ $34 + 31$ and so on	$34 + 10 + 1$ $34 + 20 + 1$ $34 + 30 + 1$ and so on
	$70 - 9$	$70 - 10 + 1$
Year 3	$53 + 12$	$53 + 10 + 2$
	$53 - 12$	$53 - 10 - 2$
	$53 + 18$	$53 + 20 - 2$
	$84 - 18$	$84 - 20 + 2$
Year 4	$38 + 68$	$38 + 70 - 2$
	$95 - 78$	$95 - 80 + 2$
	$58 + 32$	$58 + 30 + 2$
	$64 - 32$	$64 - 30 - 2$
Year 5	$138 + 69$	$138 + 70 - 1$
	$405 - 399$	$405 - 400 + 1$
Year 6	$2\frac{1}{2} + 1\frac{3}{4}$	$2\frac{1}{2} + 2 - \frac{1}{4}$
	$5.7 + 3.9$	$5.7 + 4.0 - 0.1$
	$6.8 - 4.9$	$6.8 - 5.0 + 0.1$

Partitioning: counting on or back

Examples of expectations over Years 2 to 6

	Example calculations	Possible partitioning and counting strategy
Year 2	$30 + 47$	$30 + 40 + 7$
	$78 - 40$	$70 + 8 - 40 = 70 - 40 + 8$
	$17 + 14$	$10 + 7 + 10 + 4 = 10 + 10 + 7 + 4$
Year 3	$23 + 45$	$40 + 5 + 20 + 3 = 40 + 20 + 5 + 3$
	$68 - 32$	$60 + 8 - 30 - 2 = 60 - 30 + 8 - 2$
Year 4	$55 + 37$	$55 + 30 + 7 = 85 + 7$
	$365 - 40$	$300 + 60 + 5 - 40 = 300 + 60 - 40 + 5$
Year 5	$43 + 28 + 51$	$40 + 3 + 20 + 8 + 50 + 1 = 40 + 20 + 50 + 3 + 8 + 1$
	$5.6 + 3.7$	$5.6 + 3 + 0.7 = 8.6 + 0.7$
	$4.7 - 3.5$	$4.7 - 3 - 0.5$
Year 6	$540 + 280$	$540 + 200 + 80$
	$276 - 153$	$276 - 100 - 50 - 3$

Partitioning: bridging through multiples of 10

Examples of expectations over Years 2 to 6

	Example calculations	Possible bridging strategy
Year 2	$5 + 8$ or $12 - 7$	$5 + 5 + 3$ or $12 - 2 - 5$
	$65 + 7$ or $43 - 6$	$65 + 5 + 2$ or $43 - 3 - 3$
	$24 - 19$	$19 + 1 + 4$
Year 3	$49 + 32$	$49 + 1 + 31$
	$90 - 27$	$27 + 3 + 60$
Year 4	$57 + 34$ or $92 - 25$	$57 + 3 + 31$ or $92 - 2 - 20 - 3$
	$84 - 35$	$35 + 5 + 40 + 4$
Year 5	$607 - 288$	$288 + 12 + 300 + 7$
	$6070 - 4987$	$4987 + 13 + 1000 + 70$
Year 6	$1.4 + 1.7$ or $5.6 - 3.7$	$1.4 + 0.6 + 1.1$ or $5.6 - 0.6 - 3 - 0.1$
	$0.8 + 0.35$	$0.8 + 0.2 + 0.15$
	$8.3 - 2.8$	$2.8 + 0.2 + 5.3$ or $8.3 - 2.3 - 0.5$



Partitioning: using ‘near’ doubles

Examples of expectations over Years 1 to 6

	Example calculations	Possible compensation strategy
Year 1	$6 + 7$	is double 6 and add 1 or double 7 and subtract 1
Year 2	$13 + 14$	is double 13 and add 1 or double 14 and subtract 1
	$39 + 40$	is double 40 and subtract 1
Year 3	$18 + 16$	is double 18 and subtract 2 or double 16 and add 2
	$60 + 70$	is double 60 and add 10 or double 70 and subtract 10
Year 4	$76 + 75$	is double 76 and subtract 1 or double 75 and add 1
Year 5	$160 + 170$	is double 150, then add 10, then add 20 or double 160 and add 10 or double 170 and subtract 10
Year 6	$2.5 + 2.6$	is double 2.5 and add 0.1 or double 2.6 and subtract 0.1

Partitioning: bridging through 60 to calculate a time interval

Examples of expectations over Years 3 to 6

	Examples of mental questions
Year 3	It is 10.30am. How many minutes to 10.45am?
	It is 3.45pm. How many minutes to 4.15pm?
Year 4	I get up 40 minutes after 6.30am. What time is that?
	What is the time 50 minutes before 1.10pm?
	It is 4.25pm. How many minutes to 5.05pm?
Year 5	What time will it be 26 minutes after 3.30am?
	What was the time 33 minutes before 2.15pm?
	It is 4.18pm. How many minutes to 5.00pm? 5.26pm?
Year 6	It is 08.35. How many minutes is it to 09.15?
	It is 11.45. How many hours and minutes is it to 15.20?
	A train leaves London for Leeds at 22.33. The journey takes 2 hours 47 minutes. What time does the train arrive?



Multiplication and division facts to 12 x 12

Expectations over Years 1 to 6

	Expectations
Year 1	Count on from and back to zero in ones, twos, fives and tens
	Recognise odd and even numbers to 20
	Recall the doubles of all numbers to 10
Year 2	Derive and recall doubles of all numbers to 20, and doubles of multiples of 10 to 50, and corresponding halves
	Derive and recall multiplication facts for the 2, 5 and 10 times-tables and corresponding division facts
	Recognise odd and even numbers to 100
	Recognise multiples of 2, 5 and 10
Year 3	Derive and recall doubles of multiples of 10 to 100 and corresponding halves
	Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and corresponding division facts
	Recognise multiples of 2, 3, 4, 5, 6 and 10 up to the tenth multiple
Year 4	Identify doubles of two-digit numbers and corresponding halves
	Derive doubles of multiples of 10 and 100 and corresponding halves
	Derive and recall multiplication facts up to 10×10 and corresponding division facts
	Recognise multiples of 2, 3, 4, 5, 6, 7, 8, 9 and 10 up to the tenth multiple
Year 5	Recall squares of numbers to 10×10
	Use multiplication facts to derive products of pairs of multiples of 10 and 100 and corresponding division facts
Year 6	Recall squares of numbers to 12×12 and derive corresponding squares of multiples of 10
	Use place value and multiplication facts to derive related multiplication and division facts involving decimals (e.g. 0.8×7 , $4.8 \div 6$)
	Identify factor pairs of two-digit numbers
	Identify prime numbers less than 100

Doubling and halving

Expectations over Years 1 to 6

	Expectations with examples
Year 1	Double all numbers to 10, e.g. double 9
Year 2	Double all numbers to 20 and find the corresponding halves, e.g. double 7, half of 14
	Double multiples of 10 to 50, e.g. double 40, and find the corresponding halves
	Double multiples of 5 to 50 and find the corresponding halves, e.g. double 35, half of 70
Year 3	Double multiples of 10 to 100, e.g. double 90, and corresponding halves
	Double multiples of 5 to 100 and find the corresponding halves, e.g. double 85, half 170
Year 4	Double any two-digit number and find the corresponding halves, e.g. double 47, half of 94
	Double multiples of 10 and 100 and find the corresponding halves, e.g. double 800, double 340, half of 1600, half of 680
Year 5	Form equivalent calculations and use doubling and halving, e.g. - multiply by 4 by doubling twice, e.g. $16 \times 4 = 32 \times 2 = 64$ - multiply by 8 by doubling three times, e.g. $12 \times 8 = 24 \times 4 = 48 \times 2 = 96$ - divide by 4 by halving twice, e.g. $104 \div 4 = 52 \div 2 = 26$ - divide by 8 by halving three times, e.g. $104 \div 8 = 52 \div 4 = 26 \div 2 = 13$ - multiply by 5 by multiplying by 10 then halving, e.g. $18 \times 5 = 180 \div 2 = 90$ - multiply by 20 by doubling then multiplying by 10, e.g. $53 \times 20 = 106 \times 10 = 1060$
	Multiply by 50 by multiplying by 100 and halving
	Multiply by 25 by multiplying by 100 and halving twice
Year 6	Double decimals with units and tenths, e.g. double 7.6, and find the corresponding halves, e.g. half of 15.2
	Form equivalent calculations and use doubling and halving, e.g. - divide by 25 by dividing by 100 then multiplying by 4 e.g. $460 \div 25 = 4.6 \times 4 = 18.4$ - divide by 50 by dividing by 100 then doubling e.g. $270 \div 50 = 2.7 \times 2 = 5.4$



Multiplying and dividing by multiples of 10

Expectations over Years 2 to 6

	Expectations with examples
Year 2	Recall multiplication and division facts for the 10 times table, e.g. 7×10 , $60 \div 10$
Year 3	Multiply one-digit and two-digit numbers by 10 or 100, e.g. 7×100 , 46×10 , 54×100
	Change pounds to pence, e.g. £6 to 600 pence, £1.50 to 150 pence
Year 4	Multiply numbers to 1000 by 10 and then 100, e.g. 325×10 , 42×100
	Divide numbers to 1000 by 10 and then 100 (whole-number answers), e.g. $120 \div 10$, $600 \div 100$, $850 \div 10$
	Multiply a multiple of 10 to 100 by a single-digit number, e.g. 60×3 , 50×7
	Change hours to minutes; convert between units involving multiples of 10 and 100, e.g. centimetres and millimetres, centilitres and millilitres, and convert between pounds and pence, metres and centimetres, e.g. 599 pence to £5.99, 2.5m to 250cm
Year 5	Multiply and divide whole numbers and decimals by 10, 100 or 1000, e.g. 4.3×10 , 0.75×100 , $25 \div 10$, $673 \div 100$
	Divide a multiple of 10 by a single-digit number (whole number answers), e.g. $80 \div 4$, $270 \div 3$
	Multiply pairs of multiples of 10, and a multiple of 100 by a single digit number, e.g. 60×30 , 900×8
	Multiply by 25 or 50, e.g. 48×25 , 32×50 using equivalent calculations, e.g. $48 \times 100 \div 4$, $32 \times 100 \div 2$
	Convert larger to smaller units of measurement using decimals to one place, e.g. change 2.6 kg to 2600 g, 3.5 cm to 35 mm, and 1.2 m to 120 cm
Year 6	Multiply pairs of multiples of 10 and 100, e.g. 50×30 , 600×20
	Divide multiples of 100 by a multiple of 10 or 100 (whole number answers), e.g. $600 \div 20$, $800 \div 400$, $2100 \div 300$
	Divide by 25 or 50
	Convert between units of measurement using decimals to two places, e.g. change 2.75 l to 2750 ml, or vice versa

Multiplying and dividing by single-digit numbers and multiplying by two-digit numbers

Expectations over Years 4 to 6

	Expectations with examples
Year 4	Find one quarter by halving one half
	Multiply numbers to 20 by a single-digit number, e.g. 17×3
Year 5	Multiply and divide two-digit numbers by 4 or 8, e.g. 26×4 , $96 \div 8$
	Multiply two-digit numbers by 5 or 20, e.g. 32×5 , 14×20
	Multiply by 25 or 50, e.g. 48×25 , 32×50
Year 6	Multiply a two-digit and a single-digit number, e.g. 28×7
	Divide a two-digit number by a single-digit number e.g. $68 \div 4$
	Divide by 25 or 50, e.g. 480×25 , 3200×50
	Find new facts from given facts, e.g. given that three oranges cost 24p, find the cost of four oranges



Fractions, decimals and percentages

Expectations over Years 2 to 6

	Expectations
Year 2	Find half of any even number to 40 or multiple of 10 to 100, e.g. halve 80
Year 3	Find half of any multiple of 10 up to 200, e.g. halve 170
	Find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$ of numbers in the 2, 3, 4, 5 and 10 times tables
Year 4	Find half of any even number to 200
	Find unit fractions and simple non-unit fractions of whole numbers or quantities, e.g. $\frac{3}{8}$ of 24
	Recall fraction and decimal equivalents for one-half, quarters, tenths and hundredths, e.g. recall the equivalence of 0.3 and $\frac{3}{10}$, and 0.03 and $\frac{3}{100}$
Year 5	Recall percentage equivalents of one-half, one-quarter, three-quarters, tenths and hundredths
	Find fractions of whole numbers or quantities, e.g. $\frac{2}{3}$ of 27, $\frac{4}{5}$ of 70 kg
	Find 50%, 25% or 10% of whole numbers or quantities, e.g. 25% of 20 kg, 10% of £80
Year 6	Recall equivalent fractions, decimals and percentages for hundredths, e.g. 35% is equivalent to 0.35 or $\frac{35}{100}$
	Find half of decimals with units and tenths, e.g. half of 3.2
	Find 10% or multiples of 10%, of whole numbers and quantities, e.g. 30% of 50 ml, 40% of £30, 70% of 200 g



Recall of Key Facts

Recall number bonds	Recall addition / subtraction facts	Recall multiplication / division facts	Recall fraction, decimal, percentage equivalents
Recall shape names and properties	Recall time related facts	Recall measurement facts	

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 6+
Autumn 1 st half-term							
Say the number names in order to 5	Know all the number bonds to 5	Know all the number bonds to 20	Know all the number bonds for each number to 20	Know all number bonds to 100	Know all decimals that total 1 or 10 (1 decimal place)	Know all previous number bonds including decimals	Know the two place decimal complements of 1
Autumn 2 nd half-term							
Begin to know the days of the week	Know the days of the week and the seasons and months of the year	Know multiplication and division facts for 2x table	Know multiplication and division facts for 5x and 10x tables	Know multiplication and division facts for the 7 and 8x tables	Consolidate multiplication and division facts for all times tables	Use all multiplication and division facts for the times tables up to 10x10, to derive x and ÷ of decimals numbers	Use place value and all multiplication and division facts for the times tables up to 10x10, to derive x and ÷ of small multiples of 10 and 100 (e.g. 30 x 900; 8100 ÷ 9)
Spring 1 st half-term							
Say the numbers in order to 10	Know all number bonds to 10	Know multiplication and division facts for 10x table	Know multiplication and division facts for 2x and 4x table	Know all 2-digit pairs that total 100	Know the doubles and halves of all two-digit numbers	Know doubles and halves of 2-digit decimals	Know the prime numbers within 50
Spring 2 nd half-term							
Be able to partition numbers to 5 into two groups	Know all doubles and halves to 10	Know the doubles and halves of all numbers to 20	Know doubles and halves of: All whole numbers to 20 All multiples of 10 to 500 All multiples of 100 to 5000.	Know doubles and halves of: All whole numbers to 50 All multiples of 5 to 1000 All multiples of 50 to 5000.	Know doubles and halves of: All whole numbers to 100 All multiples of 10 to 1000 All multiples of 100 to 10,000	Know the doubles and halves of all multiples of 10 to 10,000	Know the doubles and halves of all multiples of 1000 to 100,000
Summer 1 st half-term							
Count in 10s	Know all addition and subtraction facts for all numbers between 0 and 10	Know all addition and subtraction facts for multiples of 10 to 100	Know all addition and subtraction facts for: Multiples of 100 to 1000 Multiples of 5 with a total of 100 Number pairs that total 100	Know all pairs of multiples of 50 with a total of 1000	Know all pairs of factors of numbers up to 100	Know the tests for divisibility for 4 and 6	Know the decimal and percentage equivalents of the fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, tenths and fifths
Summer 2 nd half-term							
Count in 2s	Count forward and backward in steps of 2, 5 and 10	Know multiplication and division facts for 5x tables	Know all multiplication and division facts for 3x, 6x and 9x table	Know all multiplication and division facts for all tables up to 10 x 10	Know the tests for divisibility for 2,3,5,9 and 10	Know square numbers to 12 x 12	Know the square roots of square numbers to 15 x 15

Children should recall facts daily. Speed is the focus, but children should be helped to memorise them.

This timetable shows the focus for each half term but recall might be tested on previously learned facts.

These may be recalled during spare moments of the day or during routines such as lining up.

Teachers should also test recall of shapes and measurements as appropriate to age-related expectations. Careful planning of questioning can provide rich opportunities: For example, instead of $45 + \underline{\hspace{1cm}} = 100$, try “Give me two lengths which total 1m. In decimals. In fractions. In cm. In mm etc”



In Key Stage 2, ten minutes per day should be spent separately from the maths lesson to practise times tables. Children should practise these at home.

