

MATHS MENTAL MATHS COVERAGE 2022-2023

Children should secure mental methods before being introduced to written methods.

EYFS	- Say one number for each item in order: 1,2,3,4,5 - Solve real world mathematical problems with numbers up to 5. - Understand the 'one more than/one less than' relationship between consecutive numbers. - Automatically recall number bonds for numbers 0–5 and some to 10		
+ and -	Comparing everyday objects Counting skills	Developing number sense for numbers 1-10	Fluently recall all addition and subtraction facts for numbers 1-6
Notes	Long-term plan written- links to NCETM spine materials clearly outlined.		
Y1 National curriculum	- Represent and use number bonds and related subtraction facts within 20 - Add and subtract one-digit and two-digit numbers to 20, including zero - Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.		
+ and -	<u>Autumn 1</u> Recap addition and subtraction facts from 1-6 Learn all addition and subtraction facts from 7-9	<u>Autumn 2</u> Learn all number bonds to 10 Adding numbers to 10	<u>Spring 1 and 2, Summer 1 and 2</u> Calculation facts from 11-18 (addition and subtraction facts taught together) Adding 1 and adding 2 to numbers 11-18 Doubles 6-9 Near doubles 5-9 (double then add 1). Near doubles 5-9 (double-then-add-2). Bridging through 10 to add to 9. Bridging through 10 to add to 8 Subtracting 1-digit numbers from numbers 5-18. Adding any two 1-digit numbers and subtracting using the inverse of this
x and ÷	Counting in 2s	Counting in 10s	Counting in 5s

Y2 National curriculum	- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: - A two-digit number and ones - A two-digit number and tens - Two two-digit numbers - Adding three one-digit numbers		
Obj	Strategy	Examples	
<i>Adding/ subtracting a two-digit number and ones</i>	Counting forwards and backwards	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))	
	Re-ordering	5 + 34 becomes 34 + 5 12 – 7 – 2 becomes 12 – 2 – 7 17 + 9 – 7 becomes 17 – 7 + 9	
<i>Adding/ subtracting a two-digit number and tens</i>	Counting forwards and backwards	27 + 60 (count on in tens from 27) 72 – 50 (count back in tens from 72)	
<i>Adding two 2- digit numbers</i>	Partitioning both addends	65 + 23 = (60 + 20) + (5 + 3) = 88	
	Partitioning one addend	65 + 23 = 65 + 20 + 3 = 88	65 + 23 = 23 + 60 + 5 = 88
	Bridging through multiples of 10	49 + 32 = 49 + 1 + 31 = 81	
	Compensation	59 + 35 = 60 + 35 = 95 95 – 1 = 94	61 + 35 = 60 + 35 = 95 95 + 1 = 96
	Redistribution	35 + 59 = 34 + 60 = 94	
	Using near doubles	18 + 16 = 18 + 18 – 2 = or 16 + 16 + 2 =	60 + 70 = Double 60 + 10 or Double 70 – 10
<i>Subtracting two 2-digit numbers</i>	Partitioning minuend and subtrahend	78 – 52 = (70 – 50) + (8 – 2) = 26	72 – 58 (60 – 50) + (12 – 8) = 14
	Partitioning subtrahend	78 – 52 = 78 – 50 – 2 = 26	
	Counting forwards and backwards	73 – 68 (count on 2 and then 3 to 73)	
	Making connections between numbers	92 – 47 = (50 + 42) – 47 3 + 42 = 45	
	Same difference	92 – 47 = (92 + 3) – (47 + 3) = 95 – 50 = 45	

<i>Adding 3 one-digit numbers</i>	Bonds to 10	$3 + 6 + 7 =$ $10 + 6 = 16$	$8 + 6 + 6 =$ $4 + 4 + 6 + 6 =$ $4 + 6 = 10$ $4 + 6 = 10$
		$7 + 4 + 9 =$ $7 + 3 + 1 + 9 = 20$ $10 + 10 = 20$	$7 + 7 + 7$ $7 + 7 + 3 + 3 + 1$ $10 + 10 + 1 = 20$

Y3 National Curriculum	- Add and subtract numbers mentally, including: • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds - Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction - Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods		
Obj	Strategy	Examples	
Add and subtract a three-digit number and ones	Counting forwards and backwards (recap)	564 + 3 (count on in ones from 564) 675 – 7 (count back in ones from 675)	
	Re-ordering (recap)	3 + 694 becomes 694 + 3	
Add and subtract a three-digit number and tens	Counting forwards and backwards (recap)	452 + 40 (count on in tens from 452)	
Add and subtract a three-digit number and hundreds	Counting forwards and backwards (recap)	112 + 800 (count on in hundreds from 112) 960 – 500 (count back in hundreds from 960 or count on in hundreds from 500).	
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	Partitioning both addends (recap)	$365 + 123 =$ $(300 + 100) + (60 + 20) (5 + 3)$ $= 488$	$289 + 346 =$ $(200 + 300) + (80 + 40) (9 + 6) =$ $500 + 120 + 15 =$ $600 + 30 + 5 = 635$
	Partitioning one addend (recap)	$365 + 123 =$ $365 + 100 + 20 + 3 = 488$	
	Bridging through multiples of 10 (recap)	$296 + 134 = 296 + 4 + 130 =$	
	Compensation (recap)	$349 + 238 =$ $350 + 238 = 588$ $588 - 1 = 587$	$451 - 208$ $450 - 208 = 242$ $242 + 1 = 243$
	Redistribution (recap)	$219 + 431 =$ $220 + 430 = 650$	
	Near doubles (recap)	380 + 380 is double 400 and subtract 20 twice.	
	Partitioning minuend and subtrahend (recap)	$564 - 231$ $(500 - 200) + (60 - 30) + (4 - 1)$ $300 + 30 + 3 = 333$	$564 - 282$ $(400 - 200) + (160 - 80) + (4 - 2)$ $200 + 80 + 2 =$
	Partitioning subtrahend (recap)	$564 - 231$ $564 - 200 - 30 - 1 = 333$	
	Same difference (recap)	$468 - 297$ $471 - 300 = 171$	

<i>Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods</i>	Distributive Law	$24 \times 6 =$ $(20 \times 6) + (4 \times 6) =$ $120 + 24 = 144$ <table border="1"><tr><td></td><td>20</td><td>4</td></tr><tr><td>6</td><td>120</td><td>24</td></tr></table> $120 + 24$		20	4	6	120	24	Children need to understand the effect of multiplying and dividing by 10, then they can start to extend their multiplication and division skills to larger numbers.
		20	4						
	6	120	24						
	Commutative Law	$22 \times 5 = 5 \times 22$							
	Associative law	$2 \times 16 \times 5 =$ $2 \times 5 \times 16 =$ $10 \times 16 = 160$							
Rounding and adjusting (compensating)	$49 \times 3 =$ $50 \times 3 = 150$ $150 - 3 = 147$								
Dividing through partitioning	$68 \div 4 =$ $(40 \div 4) + (28 \div 4) =$ $10 + 7 = 17$								

Y4 National Curriculum	- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate (pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency) - Multiply two-digit and three-digit numbers by a one-digit number using formal written layout (pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).		
Obj	Strategy	Example	
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate (pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency)	Reordering (recap)	$1.7 + 2.8 + 0.3 =$ $1.7 + 0.3 + 2.8 = 4.8$	
	Partitioning both addends (recap)	$5,645 + 3,124 =$ $(5,000 + 3,000) + (600 + 100) +$ $(40 + 20) + (5 + 4) =$ $8,000 + 700 + 60 +$	$5,645 + 3,186 =$ $(5,000 + 3,000) + (600 + 100)$ $+ (40 + 80) + (5 + 6) =$ $8,000 + 700 + 120 + 11$ $8,000 + 800 + 30 + 1 = 8,831$
	Partitioning one addend (recap)	$5,645 + 3,124 =$ $5,645 + 3,000 + 100 + 20 + 4 =$ $8,769$	$£7.45 + £2.32 =$ $£7.45 + £2 + £0.30 + £0.02 =$ $£9.77$
	Bridging through multiples of 10	$5.6 + 3.5 =$ $5.6 + 0.4 + 3.1 =$	
	Compensation (recap)	$3,499 + 4,231 =$ $3,500 + 4,231 = 7,731$ $7,731 - 1 = 7,730$	$2\frac{1}{2} + 1\frac{3}{4} =$ $2\frac{1}{2} + 2 - \frac{1}{4} =$
	Redistribution (recap)	$4,532 + 5,128 =$ $4,530 + 5,130 = 9,660$	$£2.59 + £1.41 =$ $£2.60 + £1.40 = £4$
	Using near doubles	$1.5 + 1.6 =$ Is double 1.5 and add 0.1 or double 1.6 and subtract 0.1	
	Partitioning minuend and subtrahend (recap)	$6,698 - 4,312$ $(6,000 - 4,000) + (600 - 300) +$ $(90 - 10) + (8 - 2)$ $2,000 + 300 + 80 + 6 = 2,386$	$6,698 - 4,723$ $(5,000 - 4,000) + (1,600 - 700) + (90 - 20) + (8 - 3) =$ $1,000 + 900 + 70 + 5 = 1,975$
	Partitioning subtrahend (recap)	$5,646 - 2,313$ $5,646 - 2,000 - 300 - 10 - 3 = 3,333$	
	Same difference (recap)	$4,563 - 3,008 =$ $4,555 - 3,000 = 1,555$	$£5.32 - £1.15 =$ $£5.30 - £1.13 = £4.17$

<i>- multiply two-digit and three-digit numbers by a one-digit number using formal written layout (pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).</i>	Distributive law (recap)	$547 \times 6 =$ $(500 \times 6) + (40 \times 6) + (7 \times 6) =$ $3,000 + 240 + 42 = 3,282$
	Commutative Law (recap)	$432 \times 3 = 3 \times 432$
	Associative law (recap)	$4 \times 324 \times 5 =$ $4 \times 5 \times 324 =$ $20 \times 324 = 6480$
	Rounding and adjusting (compensating) (recap)	$601 \times 7 =$ $(600 \times 7) - 7 = 4,193$
	Dividing through partitioning (recap)	$456 \div 4 =$ $(440 \div 4) + (16 \div 4) =$ $110 + 4 = 114$

Y5 National Curriculum	- Add and subtract numbers mentally with increasingly large numbers (they practise mental calculations with increasingly large numbers to aid fluency for example, $12\ 462 - 2300 = 10\ 162$). - Multiply and divide numbers mentally drawing upon known facts	
Obj	Strategy	Example
<i>add and subtract numbers mentally with increasingly large numbers (they practise mental calculations with increasingly large numbers to aid fluency for example, $12\ 462 - 2300 = 10\ 162$).</i>	Partitioning both addends (recap)	$15,645 + 13,124 =$ $(10,000 + 10,000) + (5,000 + 3,000) + (600 + 100) + (40 + 20) + (5 + 4) =$ $20,000 + 8,000 + 700 + 60 + 9 = 28,769$
	Partitioning one addend (recap)	$15,645 + 13,124 =$ $15,645 + 10,000 + 3,000 + 100 + 20 + 4 = 28,769$
	Compensation (recap)	$14,999 + 32,321 =$ $15,000 + 32,321 = 47,321$ $47,321 - 1 = 47,320$
	Redistribution (recap)	$56,398 + 34,402 =$ $56,400 + 34,400 = 80,800$
	Partitioning minuend and subtrahend (recap)	$45,646 - 22,313$ $(40,000 - 20,000) + (5,000 - 2,000) + (600 - 300) + (40 - 10) + (6 - 3) =$ $20,000 + 3,000 + 300 + 30 + 3 = 23,333$
	Partitioning subtrahend (recap)	$45,646 - 22,313$ $45,646 - 20,000 - 2,000 - 300 - 10 - 3 = 23,333$
	Same difference (recap)	$67,523 - 34,896 =$ $67,527 - 34,900 =$ $67,527 - 34,000 - 900 =$ $33,527 - 900 = 32,627$
<i>multiply and divide numbers mentally drawing upon known facts</i>	Multiply by 25 and 50	Multiply by 50 by multiplying by 100 and halving Multiply by 25 by multiplying by 100 and halving twice $48 \times 25, 32 \times 50$ using equivalent calculations, e.g. $48 \times 100 \div 4, 32 \times 100 \div 2$
	Distributive law (recap)	$5,632 \times 4 =$ $(5,000 \times 4) + (600 \times 4) + (30 \times 4) + (2 \times 4) =$ $20,000 + 2,400 + 120 + 8 = 22,528$
	Commutative Law (recap)	$5,643 \times 5 = 5 \times 5,643$
	Associative law (recap)	$5 \times 7,893 \times 2 =$ $5 \times 2 \times 7,893 =$ $10 \times 7,893 = 78,930$
	Rounding and adjusting (recap)	$3998 \times 4 =$ $4,000 \times 4 = 1,600$ $1,600 - 8 = 1,592$
	Dividing through partitioning (recap)	$5,635 \div 5 =$ $5,000 \div 5 = 1,000$ $600 \div 5 = 120$ $35 \div 5 = 7$ $1,000 + 120 + 7 = 1,127$

Yr 6 National Curriculum	- Perform mental calculations, including with mixed operations and large numbers		
Obj	Strategy	Example	
perform mental calculations, including with mixed operations and large numbers	Partitioning both addends (recap)	$215,645 + 713,124 =$ $(200,000 + 700,000) +$ $(10,000 + 10,000) + (5,000 + 3,000) + (600 + 100) + (40 + 20) + (5 + 4) =$ $900,000 + 20,000 + 8,000 + 700 + 60 + 9 = 928,769$	$4.563 + 5.432 =$ $4 + 5 = 9, 0.5 + 0.4 = 0.9, 0.06 + 0.03 = 0.09, 0.003 + 0.002 = 0.005 =$ $9 + 0.9 + 0.09 + 0.005 = 9.995$
	Partitioning one addend (recap)	$215,645 + 713,124 =$ $215,645 + 700,000 + 10,000 + 3,000 + 100 + 20 + 4 = 928,769$	
	Compensation (recap)	$144,997 + 132,342 =$ $150,000 + 132,342 = 282,342$ $282,342 - 3 = 282,339$	
	Redistribution (recap)	$156,398 + 234,402 =$ $156,400 + 234,400 = 380,800$	
	Partitioning minuend and subtrahend (recap)	$345,646 - 222,313 =$ $(300,000 - 200,000) + (40,000 - 20,000) + (5,000 - 2,000) + (600 - 300) + (40 - 10) + (6 - 3) =$ $100,000 + 20,000 + 3,000 + 300 + 30 + 3 = 123,333$	
	Partitioning subtrahend (recap)	$345,646 - 222,313$ $345,646 - 200,000 - 20,000 - 5,000 - 600 - 40 - 6 = 123,333$	
	Same difference (recap)	$46,995 + 32,521 =$ $47,000 + 32,526 = 79,526$	$50,000 - 43,871 =$ $49,999 - 43,870 = 6,129$
perform mental calculations, including with mixed operations and large numbers	Factorisation	$15 \times 12 =$ $15 \times 2 \times 6 =$ $30 \times 6 = 180$	$600 \div 120 =$ $600 \div 10 \div 12 = 5$
	Repeat mental methods for x and ÷ from year 5 objectives but with increasingly complex numbers including fractions and decimals		