September 2020

Number Talks-Mental Calculation Strategies- Addition and Subtraction

Year 1

Count on or back in ones (chain count and link to objects, i.e. 1-1 correspondence). *Concrete – counters, beadstring, cubes on a number track* *Pictorial – number line*	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
Reorder numbers in a calculation. *Concrete – counters, counters in a ten frame*	8 + 3 doesn't need reordering as the greater number is first already 2 + 7 reorder as 7 + 2 5 + 13 reorder as 13 + 5 11 + 6 doesn't need reordering as the greater number is first already
Partition small numbers, e.g. 8 + 3 = 8 + 2 + 1 and 11 – 3 = 11 – 1 – 2 *Concrete – counters in a ten frame, beadstring* *Pictorial – number line*	7 + 5 partitioned as 7 + 3 + 2 9 + 7 partitioned as 9 + 1 + 6 6 + 8 partitioned as 6 + 4 + 4 or reordered and partitioned as 8 + 2 + 4 12 – 5 partitioned as 12 – 2 – 3 14 – 8 partitioned as 14 – 4 – 4

Year 2

Count on or back in ones and tens from any given number, e.g. (36 + 40 =) *Concrete – Diennes equipment, place value counters, beadstring* *Pictorial – Diennes jottings, number line*	36 + 40 = __ 30 + 48 = __ 89 – 50 = __ 76 – __ = 46
Partition and combine multiples of tens and ones. *Concrete – Diennes equipment, place value counters, beadstring* *Pictorial – Diennes jottings, number line*	40 + 37 40 add **30** and **7** = 40 add 30 add 7 15 + 14 **10** and **5** add **10** and **4** = 10 add 10 add 5 add 4 or 15 add 10 add 4 37 + 12 37 add **10** and **2** = 37 add 10 add 2 78 – 42 78 take away **40** and **2** = 78 take away 40 take away 2 80 – 35 80 take away **30** and **5** = 80 take away 30 take away 5

Reorder numbers in a calculation. *Concrete – Diennes equipment, place value counters, beadstring* *Pictorial – Diennes jottings, number line*	28 + 3 doesn't need reordering as the greater number is first already 2 + 17 reorder as 17 + 2 5 + 63 reorder as 63 + 5 16 – 8 will not give the same answer if reordered
Find a small difference by counting up from the lesser to the greater number *Concrete – Diennes equipment shown horizontally, beadstring* *Pictorial – Number line*	52 – 47 74 – 66 81 – 79 32 – 25
Begin to bridge through 10 when adding a single digit number (partitioning, e.g. 58 + 5 = 58 + 2 + 3) *Concrete – Diennes equipment, place value counters, beadstring* *Pictorial – number line*	58 + 5 = 58 + 2 = 60 60 + 3 = 63 63 + 8 = 63 + 7 = 70 70 + 1 = 71 46 + 7 = 46 + 4 = 50 50 + 3 = 53 48 + 7 = 48 + 2 = 50 50 + 5 = 55
Add or subtract 9 or 11 and 19 or 21 by rounding and compensating. *Concrete – Diennes equipment, place value counters* *Pictorial – number line, 100 square*	34 + 9 as 34 + 10 – 1 34 + 11 as 34 +10 + 1 77 + 19 as 77 + 20 – 1, or 77 + 10 + 10 – 1 46 – 9 as 46 – 10 + 1 46 – 11 as 46 – 10 – 1 63 – 19 as 63 – 20 + 1, or 63 – 10 – 10 + 1

Year 3

Identify and use knowledge of number bonds within a calculation. *Concrete – tens frames, Diennes equipment, place value counters* *Pictorial – Diennes jottings, number line*	42 + 38 42 + 30 + 8 (recognising that 2 and 8 is a number bond to 10, so the answer will be a multiple of 10) 60 – 28 60 – 20 – 8 (using knowledge that 10 – 8 = 2, so 40 – 8 = 32) 120 – 50 120 – 20 – 30 (using knowledge of number bonds to 100, leaving an answer of 70)
Derive and use addition and subtraction facts for 100 *Concrete – Diennes equipment, place value counters, beadstring* *Pictorial – Number line*	100 – 43 = __ 22 + __ = 100 100 = __ + 9 100 – 76 = __ 100 – __ = 48 66 = 100 – __

Derive and use addition and subtraction facts for multiples of 100 that total 1000 *Concrete – Diennes equipment, place value counters* *Pictorial – Diennes jottings*	1000 – 300 = __ 200 + __ = 1000 1000 = __ + 500 1000 – 400 = __ 1000 – __ = 100 600 = 1000 – __
Reorder numbers in a calculation. *Concrete – tens frames, Diennes equipment, place value counters* *Pictorial – Diennes jottings, number line*	23 + 54 54 + 23 12 + 19 + 12 12 + 12 + 19 (using knowledge of doubles) 6 + 8 + 4 6 + 4 + 8 (using knowledge of number bonds to 10) 70 + 50 + 30 70 + 30 + 50 (using knowledge of number bonds to 100)
Partition and combine multiples of hundreds, tens and ones. *Concrete – Diennes equipment, place value counters, beadstring* *Pictorial – number line*	526 + 200 counting on in hundreds 137 + 40 counting on in tens 272 + 8 counting on in ones (or using knowledge of bonds to 10) 428 – 200 counting back in hundreds 323 – 70 counting back in tens 693 – 8 counting back in ones 37 + 15 37 add 10 and 5 = 37 add 10 add 5 (crossing tens boundaries) 42 – 25 42 take away 20 and 5 = 42 take away 20 take away 5 (crossing tens boundaries)
Find differences by counting up through the next multiple of 10 or 100 *Pictorial - number line*	60 – 43 useful for time calculations, e.g. a journey time from 2:43 until 3:00 53 – 38 efficient because the numbers are close to each other 104 – 95 efficient because the numbers are close to each other 200 – 86 useful for money calculations, e.g. change from £2 when spending 86p
Bridge through 10 when adding or subtracting a single digit number (partitioning, e.g. 58 + 5 = 58 + 2 + 3 or 76 – 8 = 76 – 6 – 2) *Pictorial - number line*	35 + 7 as 35 + 5 + 2 97 + 6 as 97 + 3 + 3 178 + 5 as 178 + 2 + 3 42 – 7 as 42 – 2 – 5 204 – 6 as 204 – 4 – 2 371 – 5 as 371 – 1 – 4
Add or subtract 9, 19, 29 etc by rounding and compensating *Pictorial - number line*	34 + 29 as 34 + 30 – 1 127 + 49 as 127 + 50 – 1 96 – 39 as 96 – 40 + 1 273 – 59 as 273 – 60 + 1

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Year 4

Derive and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)	0.5 + __ = 1 __ + 0.7 = 1 1 = 0.3 + __ 1 = __ + 0.8 1 – 0.8 = __ 1 – __ = 0.6 0.4 = 1 – __ __ = 1 – 0.9 2.3 + __ = 10 __ + 8.2 = 10 10 = 5.6 + __ 10 = __ + 2.2 10 – 6.1 = __ 10 – __ = 4.9 2.8 = 10 – __ __ = 10 – 6.7
Partition and combine multiples of hundreds, tens and ones. *Concrete – Diennes equipment, place value counters* *Pictorial – number line*	320 + 150 320 **add 100** = 420 then **add 50** = 470 243 + 230 243 **add 200** = 443 then **add 30** = 473 460 – 140 460 **subtract 100** = 360 then **subtract 40** = 320 562 – 320 562 **subtract 300** = 262 then **subtract 20** = 242 234 + 125 234 **add 100** = 334 then **add 20** = 354 then **add 5** = 359 (not crossing any boundaries) 765 – 241 765 **subtract 200** = 565 then **subtract 40** = 515 then subtract 1 = 514 (not crossing any boundaries) 85 + 47 85 **add 40** = 125 then **add 7** = 132 (crossing hundreds and tens boundaries) 122 – 35 122 **subtract 30** = 92 then **subtract 5** = 87 (crossing hundreds and tens boundaries)
Reorder numbers in a calculation. *Concrete – Diennes equipment, place value counters, beadstring*	7 + 12 + 3 + 5 reordered as 7 + 3 + 12 + 5 to make use of the bond to 10 18 + 6 – 8 reordered as 18 – 8 + 6 to make use of the place value of 18 27 + 75 reordered as 75 + 27 to make use of 75 + 25 seeing 27 as 25 + 2
Identify and use knowledge of number bonds within a calculation and identify related facts, e.g. 150 + 270 from 15 + 27 *Concrete – Diennes equipment, place value counters* *Pictorial – Diennes jottings*	120 + 80 using knowledge of 12 + 8 = 20 250 + 130 using knowledge of 25 + 13 = 38 200 – 70 using knowledge of 20 – 7 = 13 460 – 150 using knowledge of 46 – 15 = 31
Find differences by counting up through the next multiple of 10 or 100	80 – 43 43 **+ 7** = 50 **+ 30** = 80 so the difference is **37** 92 – 35 35 **+ 5** = 40 **+ 50** = 90 **+ 2** = 92 so the difference is **57**

Concrete – Diennes equipment, beadstring *Pictorial – number line*	203 – 96 96 **+ 4** = 100 **+ 100** = 200 **+ 3** = 203 so the difference is **107** 504 – 180 180 **+ 20** = 200 **+ 300** = 500 **+ 4** = 504 so the difference is **324**
Bridge through 10 when adding or subtracting a single digit number (partitioning, e.g. 58 + 5 = 58 + 2 + 3 or 76 – 8 = 76 – 6 – 2) *Concrete – Diennes equipment, beadstring* *Pictorial – number line*	48 + 35 as 48 + 2 + 33 = 50 + 33 = 83 97 + 64 as 97 + 3 + 61 = 100 + 61 = 161 103 – 25 as 103 – 3 – 22 = 100 – 22 (using number bonds to 100) 230 – 72 as 230 – 30 – 40 – 2 = 200 – 40 – 2
Add or subtract a multiple of 10 and adjust (for those numbers close to multiples of 10) *Concrete – Diennes equipment, place value counters* *Pictorial – number line*	84 + 28 as 84 + 30 – 2 = 114 – 2 = 112 167 + 48 as 167 + 50 – 2 = 217 – 2 = 215 96 – 38 as 96 – 40 + 2 = 56 + 2 = 58 213 – 58 as 213 – 60 + 2 = 153 + 2 = 155

Year 5

Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places) *Concrete – (if necessary) place value counters* *Pictorial – number line*	0.45 + __ = 1 __ + 0.27 = 1 1 = 0.39 + __ 1 = __ + 0.78 1 – 0.08 = __ 1 – __ = 0.61 0.54 = 1 – __ __ = 1 – 0.89

Partition and combine multiples of thousands hundreds, tens and ones. *Concrete (if necessary) – place value counters* *Pictorial – number line*	4300 + 1400 4300 **add 1000** = 5300 then **add 400** = 5700 364 + 250 364 **add 200** = 564 then **add 50** = 614 3600 – 1200 3600 **subtract 1000** = 2600 then **subtract 200** = 2400 432 – 240 432 **subtract 200** = 232 then **subtract 40** = 192 5124 + 1352 5124 **add 1000** = 6124 then **add 300** = 6424 then **add 50** = 6474 then **add 2** = 6476 (not crossing any boundaries)

	7584 – 2351	7584 **subtract 2000** = 5584 then **subtract 300** = 5284 then **subtract 50** = 5234 then **subtract 1** = 5233 (not crossing any boundaries)
Partition and combine multiples of ones and tenths. *Concrete (if necessary) – place value counters* *Pictorial – number line*	5.4 + 3.2 4.7 – 2.5	5.4 **add 3** = 7.4 then **add 0.2** = 7.6 4.7 **subtract 2** = 2.7 then **subtract 0.5** = 2.2
Identify and use knowledge of number bonds within a calculation and identify related facts, e.g. 1.5 + 2.7 from 15 + 27 *Concrete (if necessary) – place value counters*	1.2 + 0.8 2.5 + 1.3 3.8 + 4.5 2 – 0.7 4.6 – 1.5 8.3 – 5.4	using knowledge of 12 + 8 = 20 using knowledge of 25 + 13 = 38 using knowledge of 38 + 45 = 83 using knowledge of 20 – 7 = 13 using knowledge of 46 – 15 = 31 using knowledge of 83 – 54 = 29
Bridge through 10 when adding or subtracting a single digit number (partitioning, e.g. 58 + 5 = 58 + 2 + 3 or 76 – 8 = 76 – 6 – 2) *Concrete (if necessary) – Diennes equipment, place value counters* *Pictorial – number line*	594 + 170 1995 + 278 703 – 128 3002 – 87	as 594 + 6 + 164 = 600 + 164 as 1995 + 5 + 273 = 2000 + 273 as 703 – 3 – 125 = 700 – 125 as 3002 – 2 – 85 = 3000 – 85
Find differences by counting up through the next multiple of 1, 10, 100 or 1000 *Concrete (if necessary) – place value counters* *Pictorial – number line*	604 – 289 523 – 160 1200 – 785 5003 – 1960 7.3 – 2.8 20.1 – 6.7	289 **+ 11** = 300 **+ 300** = 600 **+ 4** = 604 so the difference is **315** 160 **+ 40** = 200 **+ 300** = 500 **+ 23** = 523 so the difference is **363** 785 **+ 15** = 800 **+ 400** = 1200 so the difference is **415** 1960 **+ 40** = 2000 **+ 3003** = 5003 so the difference is **3043** 2.8 **+ 0.2** = 3 **+ 4** = 7 **+ 0.3** = 7.3 so the difference is **4.5** 6.7 **+ 3.3** = 10 **+ 10.1** = 20.1 so the difference is **13.4**
Add or subtract a multiple of 10 and adjust (for those numbers close to multiples of 10) *Concrete (if necessary) – Diennes equipment, place value counters* *Pictorial – number line*	257 + 68 325 + 298 764 – 88 876 – 397	as 257 + 70 – 2 = 327 – 2 as 325 + 300 – 2 = 625 – 2 as 764 – 90 + 2 = 674 + 2 as 876 – 400 + 3 = 476 + 3

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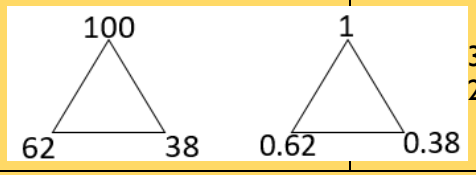
Year 6

Partition and combine multiples of thousands hundreds, tens and ones *Concrete (if necessary) – place value counters* *Pictorial – number line*	5800 + 2400 873 + 350 4100 - 1600 1000 take away 600 2132 - 440 take away 40 5124 + 1352 7584 - 2351	5800 add 2000 and 400 = 5800 add 2000 add 400 873 add 300 and 50 = 873 add 300 add 50 4100 take away 1000 and 600 = 4100 take away 2132 take away 400 and 40 = 2132 take away 400 5124 add 1000 and 300 and 50 and 2 = 5124 add 1000 add 300 add 50 add 2 (crossing no boundaries) 7584 take away 2000 and 300 and 50 and 1 = 7584 take away 2000 take away 300 take away 50 take away1 (crossing no boundaries)
Partition and combine multiples of ones and tenths *Concrete (if necessary) – place value counters* *Pictorial – number line*	8.4 + 3.8 13.2 – 4.5 away 0.5	8.4 add 3 and 0.8 = 8.4 add 3 add 0.8 13.2 take away 4 and 0.5 = 13.2 take away 4 take
Identify and use knowledge of number bonds within a calculation and identify related facts, e.g. 680 + 430, 6.8 + 4.3, 0.68 + 0.43 can all be worked out using the related calculation 68 + 43 *Concrete (if necessary) – place value counters* *Pictorial – related facts addition trios*  	0.62 + 0.38 0.75 + 0.56 2.8 + 0.43 35 2	using knowledge of 62 + 38 = 100 using knowledge of 75 + 56 = 131 using knowledge of 280 + 43 = 323 using knowledge of 100 – 41 = 59 using knowledge of 92 – 35 = 57 using knowledge of 830 – 52 = 778

Find differences by counting up through the next multiple of 0.1, 1, 10, 100 or 1000 *Pictorial – number line*	8.2 – 3.46 14.23 – 7.58

Bridge through 10 when adding or subtracting a single digit number (partitioning, e.g. 58 + 5 = 58 + 2 + 3 or 76 – 8 = 76 – 6 – 2) *Pictorial – number line*	1.5 + 1.7 0.7 + 0.56 8.3 – 2.7	as 1.5 + 0.5 + 1.2 as 0.7 + 0.3 + 0.26 as 8.3 – 2.3 – 0.4
Add or subtract a multiple of 1 or 10 and adjust (for those numbers close to multiples of 1 or 10) *Pictorial – number line*	5.6 + 3.9 7.5 – 4.8	as 5.6 + 4 – 0.1 as 7.5 – 5 + 0.2