Addition

Continue **bridging and partitioning** from year 2 extending to larger numbers and decimals

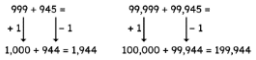
Partitioning

240 + 110
= 200 + 100 + 40 + 10
= 300 + 50
= 350

Unitising

0.3 +0.2
= 3 tenths + 2 tenths
= 5 tenths
= 0.5

Redistribution (move 1 addend to another)



Compensation (change one addend to make the calculation easier, then adjust back to keep the total correct.)



Compensation (compensation to maintain equality when adjusting one number in an equation)

£30 + £26 = £56
+ £0.76 + £0.76
£30.76 + £26 = £56.76

Column addition up to 7 digits (including decimals)

		4	5.2		
		3	3.4	7	
+			3.5		
	8	2	1.1	7	
	1	1			

Subtraction

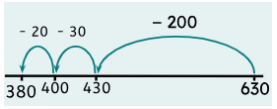
Partitioning

630 − 250 = 380
200 50

Unitising

680 - 540 = 140
68 tens - 54 tens = 14 tens
50 4

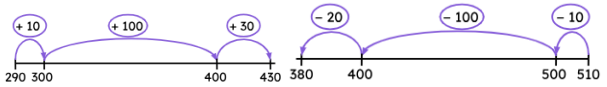
Bridging



Difference (counting on or counting back)

430- 290 =140

510 – 380 =130



Column subtraction including decimals

	2 3.1 7	km
−	2.9	km
	0.8	km

Compensation- (because we change the minuend and the difference also changes)

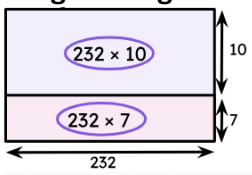
183 − 47 = 136
+ 4 − 4
187 − 47 = 140

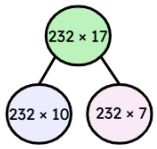
Compensation- (both whole and part change by the same amount so difference remains the same- constant difference)

19.67 − 3.95 = 15.72
+ 0.05 + 0.05
19.72 − 4.00 = 15.72

Multiplication

3-digit x 2 digit informal (partitioning)





2	3	2		2	3	2		2	3	2	0
	1	0	×			7	×	1	6	2	4 +
2	3	2	0	1	6	2	4	3	9	4	4

Long multiplication

No regrouping

Long multiplication

	3	3	
	2	1	×
	3	3	
6	6	0	+
6	9	3	

Regrouping

1	1			
	1	5	3	
		2	2	×
	3	0	6	
3	0	6	0	+
3	3	6	6	

	1	2	1		
	1	3	4	6	
			2	5	×
	6	7	3	0	
2	6	9	2	0	+
3	3	6	5	0	
1	1				

Associative law - The associative law states that it doesn't matter how you group or pair values (i.e. which we calculate first), the result is still the same. It applies for addition and multiplication.

$41 \times 15 = 41 \times 5 \times 3$
$= 205 \times 3$
$= 615$

$41 \times 15 = 41 \times 3 \times 5$
$= 123 \times 5$
$= 615$

Short multiplication and combining **partial products.**

	3	3			3	3				6	6	0	
	2	0	×			1	×				3	3	+
6	6	0			3	3				6	9	3	

Long multiplication

	3	3	
	2	1	×
	3	3	
6	6	0	+
6	9	3	

Division

Short division

$528 \div 12 = 44$

			0	4	4	
1	2	5	$^{5}2$	$^{4}8$		

Long division known facts

$792 \div 12 = 66$

			0	6	6	
1	2	7	9	2		
		7	2			(6 tens × 12 = 72 tens)
			7	2		
			7	2		(6 ones × 12 = 72 ones)
				0		

Outside known multiplication facts

$578 \div 17 = 34$

			0	3	4	
1	7	5	7	8		
		5	1			(3 tens × 17 = 51 tens)
			6	8		
			6	8		(4 ones × 17 = 68 ones)
				0		

	× 17
1	17
2	34
3	51
4	68
5	85
6	102
7	119
8	136
9	153
10	170

2-digit divisor with remainders

$5{,}400 \div 35 = 154$ r 10

		0	1	5	4	
3	5	5,	4	0	0	
		3	5			(1 hundred × 35 = 35 hundreds)
		1,	9	0	0	
		1	7	5		(5 tens × 35 = 175 tens)
			1	5	0	
			1	4	0	(4 *ones* × 35 = 140 *ones*)
				1	0	

	× 35
1	35
2	70
3	105
4	140
5	175
6	210
7	245
8	280
9	315
10	350

2-digit divisor with fraction remainders

3,600 ÷ 28 = 128 r 16

		0	1	2	8	
2	8	3,	6	0	0	
		2	8			
			8	0	0	(1 hundred × 28 = 28 hundreds)
			5	6		(2 tens × 28 = 56 tens)
			2	4	0	
			2	2	4	(8 ones × 28 = 224 ones)
				1	6	

The **remainder** can be represented in a different way.

16 apples could partly fill a bag.

The whole bag is 28 and my **remainder** is 16

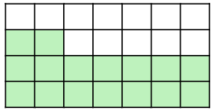
I could say that this is $\frac{16}{28}$ of a bag.



So 128 full bags and $\frac{16}{28}$ of a bag.

3,600 ÷ 28 = 128 r 16

3,600 ÷ 28 = $128\frac{16}{28}$



2-digit divisor with remainders as decimals



28 is 28 ones which can be regrouped as 280 tenths.



I can make 8 groups of 35 tenths with 280 tenths.

5,418 ÷ 35 = 154.8

			0	1	5	4.	
3	5	5,	4	1	8.	0	
			3	5			
			1,	9	1	8	
			1	7	5		
				1	6	8	
				1	4	0	
					2	8.0	(8 tenths × 35 = 280 tenths)
					2	8.0	