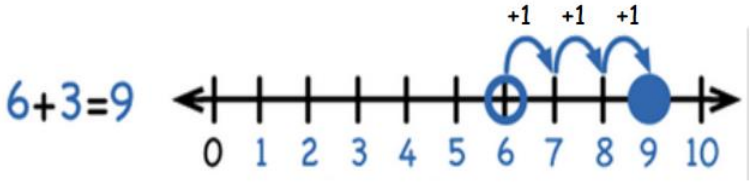
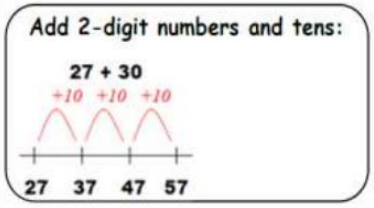
Addition

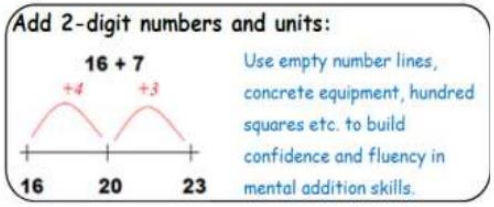
<table>
<tr><th>Y1</th><th>Y2</th></tr>
<tr>
<td>Adding with numbers up to 20.

Use numbered number lines to add, by counting on in ones, encouraging children to begin with larger number and count on.

 
</td>
<td>Add with 2-digit numbers.

Use an empty number line to add 2 digit numbers and tens, 2 digits and ones, 2 digit numbers.

Move on to expanded column method- adding the ones first and then the tens.

<table>
<tr><td></td><td>5</td><td>6</td><td></td><td></td><td></td><td></td></tr>
<tr><td>+</td><td>3</td><td>3</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>9</td><td>(6</td><td>+</td><td>3)</td><td></td></tr>
<tr><td></td><td>8</td><td>0</td><td>(50</td><td>+</td><td>30)</td><td></td></tr>
<tr><td></td><td>8</td><td>9</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td>
</tr>
</table>

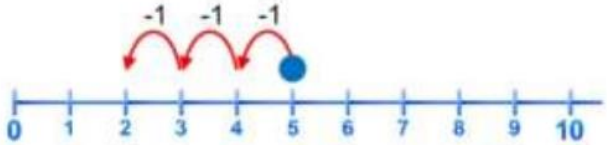
Y3	Y4
Add numbers up to 3 digits. Use of compact column method. Add the ones first, carry numbers underneath the bottom line, remind pupils of actual value eg, 3 tens add 7 tens. 236 + 73 309 1	Add numbers with up to 4 digits. Continue to use the compact column method, adding ones first and carrying underneath the calculation. Also include money and measures contexts. **H T O** 3 7 1 + 4 8 5 8 5 6 **H T O** 3 7 6 + 4 8 5 8 6 1 **Th H T O** 2 3 8 8 + 1 1 2 4 3 5 1 2

Y5	Y6
Add numbers with more than 4 digits. Continue to use compact column addition, adding numbers with more than 4 digits. 3 2879 + 3 5987 6 8866 • Addition of money and decimals. £23.59 + £7.55 £31.14 19.01 3.65 +0.70 23.36	Add several numbers of increasing complexity using compact column addition. 23.361 9.080 59.770 + 1.300 93.511 81,059 3,668 15,301 + 20,551 120,579

Subtraction

Y1

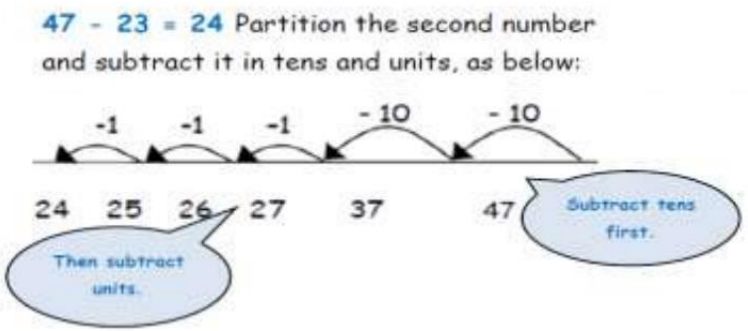
Subtract from numbers up to 20.
Use of a numbered number line by counting back in ones.



5 - 3 = 2

Y2

Subtract with 2-digit numbers.
Subtract the second number by partitioning, subtracting the tens and then the ones on an empty number line.

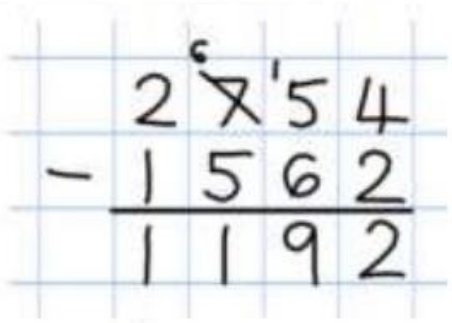


Move on to formal column subtraction, ensuring children are confident with the place value of the numbers they are subtracting.

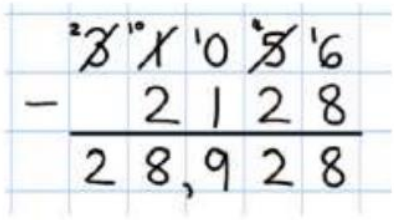
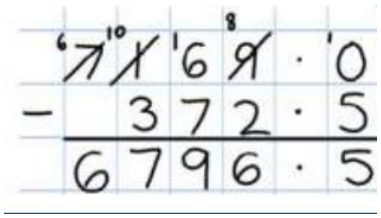
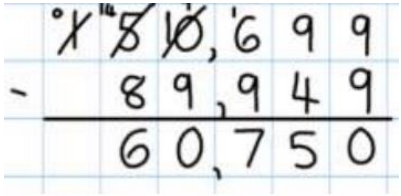
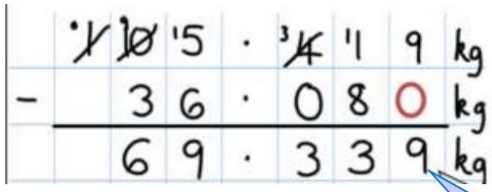
	5	6				
-	3	3				
		3	(6	-	3)	
	2	0	(50	-	30)	
	2	3				

Y3	Y4
Subtract with 2 and 3-digit numbers. Use of the compact column method which requires children to subtract the ones, the tens and then the hundreds. Moving on to 'exchanging' using the compact column method.	Subtract with up to 4-digit numbers. Subtract using formal compact method, exchanging where necessary.

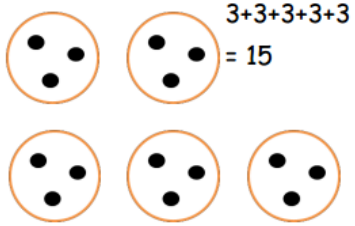
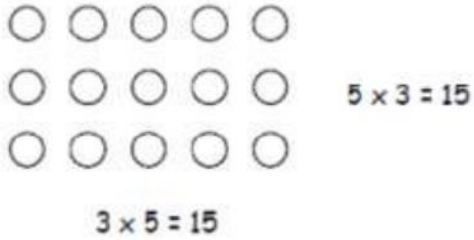
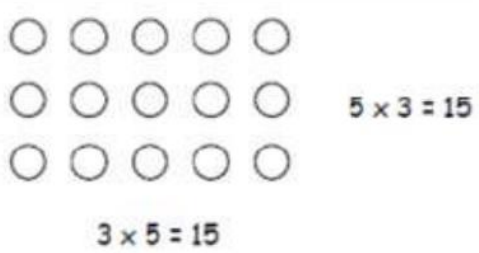
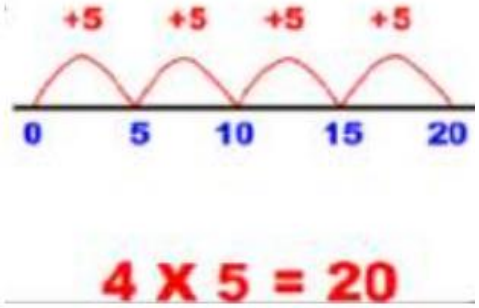
	3	8			5 ~~6~~	1 3			
-	1	2		-	1	5			
	2	6			4	8			
	2	6	5			2	6 ~~7~~	1 4	
-		3	3		-	1	4	6	
	2	3	2			1	2	8	



	2 ~~3~~	9 ~~0~~	1 0	9					
-	1	4	7	6					
	1	5	3	3					

Y5	Y6
Subtract with at least 4-digit numbers (including money and measures). Compact column method for subtraction.  Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal point. 	Subtracting with increasingly large and more complex numbers and decimal values. Compact column method for subtraction.  Ensure that empty decimal places are filled with a zero to show the place value of each column. 

Multiplication

Y1	Y2
Multiply with concrete objects, arrays and pictorial representations. How many legs will 3 teddies have?  There are 3 sweets in one bag. How many sweets are in 5 bags altogether?  Multiplication using an array:  	Multiplication using arrays and repeated addition on a number line. Multiplication using an array.  Multiplication as repeated addition on a number line. 

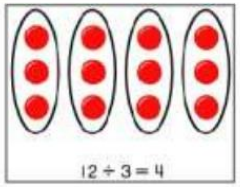
Y3	Y4
Multiply 2-digit numbers by a single digit number. The grid method. Eg. 23 x 8 = 184 **X** | **20** | **3** **8** | 160 | 24 |		1	6	0 | |	+		2	4 | |		1	8	4 | |				|	Multiply 2 and 3 digits by a single digit using all multiplication tables up to 12 x 12. **Short multiplication** 24 × 6 becomes 2 4 × 6 1 4 4 2 Answer: 144 342 × 7 becomes 3 4 2 × 7 2 3 9 4 2 1 Answer: 2394

Y5	Y6
Multiply up to 4 digits by 1 or 2 digits. Short multiplication by 1 digit number: 342 × 7 becomes 3 4 2 × 7 2 3 9 4 2 1 Answer: 2394 2741 × 6 becomes 2 7 4 1 × 6 1 6 4 4 6 4 2 Answer: 16 446 Long division by a 2 digit number: 24 × 16 becomes 2 2 4 × 1 6 2 4 0 (24 x 10) 1 4 4 (24 x 6) 3 8 4 Answer: 384 124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 (124 x 6) 2 4 8 0 (124 x 20) 3 2 2 4 1 1 Answer: 3224	Short and long multiplication, as in Year 5, and multiply decimals with up to 2 decimal places by a single digit. Short multiplication by 1 digit number: 342 × 7 becomes 3 4 2 × 7 2 3 9 4 2 1 Answer: 2394 2741 × 6 becomes 2 7 4 1 × 6 1 6 4 4 6 4 2 Answer: 16 446 Long division by a 2 digit number: **Long multiplication** 24 × 16 becomes 2 2 4 × 1 6 2 4 0 1 4 4 3 8 4 Answer: 384 124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224

Division

Y1	Y2
Group and share small quantities. Use lots of practical apparatus, arrays and picture representations and be taught to understand the difference between "grouping" objects (How many groups of 2 can you make?) and "sharing" (Share these sweets between 2 people)	Group and share using the ÷ and = signs. Use grouping on a number line.

Arrays:



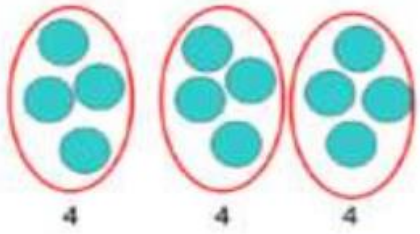
This represents **12 ÷ 3, posed as** how many groups of 3 are in 12?

Pupils should also show that the same array can represent **12 ÷ 4 = 3** if grouped horizontally.

Grouping:

12 children put into groups of 4 is 3 groups.

Sharing:

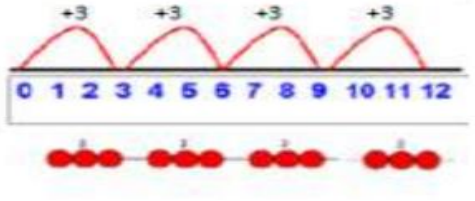


12 shared between 3 is 4

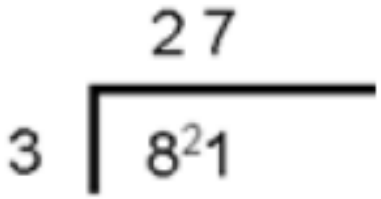
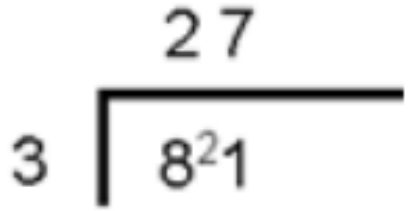
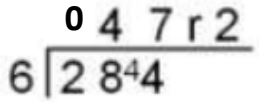
Grouping using a number line

Group from zero in equal jumps to find 'how many groups of _ in _?

Use bead-bars/strings to make link to number line.



12 ÷ 3 = 4

Y3	Y4
Divide 2-digit numbers by a single digit. Use of short division: 	Divide up to 3-digit numbers by a single digit. Use of short division.  Example with remainder: 

Y5	Y6
Divide up to 4 digits by a single digit < or = to 12, including answers with remainders.	Divide at least 4-digit numbers by single and 2-digit numbers (including decimals).

Y5

432 ÷ 5 becomes

$$\begin{array}{r} 8\ 6\ r2 \\ 5\overline{)\,4\ 3^{3}\ 2} \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 4\ 5\ r1 \\ 1\ 1\overline{)\,4\ 9^{5}\ 6} \end{array}$$

Answer: $45\frac{1}{11}$

Y6

Short division:

Short division

98 ÷ 7 becomes

$$\begin{array}{r} 1\ 4 \\ 7\overline{)\,9^{2}\ 8} \end{array}$$

Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 8\ 6\ r2 \\ 5\overline{)\,4\ 3^{3}\ 2} \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 4\ 5\ r1 \\ 1\ 1\overline{)\,4\ 9^{5}\ 6} \end{array}$$

Answer: $45\frac{1}{11}$

Long division:

432 ÷ 15 becomes

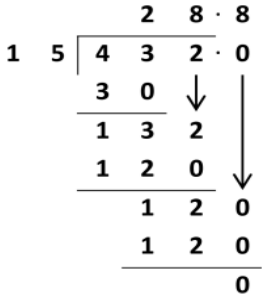
$$\begin{array}{rr} & 2\ 8 \\ 1\ 5\overline{)} & 4\ 3\ 2 \\ & 3\ 0\ 0 \quad 15\times20 \\ \hline & 1\ 3\ 2 \\ & 1\ 2\ 0 \quad 15\times8 \\ \hline & 1\ 2 \end{array}$$

$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$

Answer: $28\frac{4}{5}$

Reduce fraction to the simplest form

$432 \div 15$ becomes



Answer: 28·8

Give the answer as a decimal.