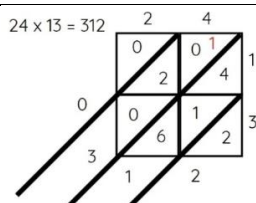


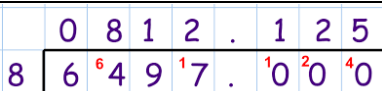
Number Skills

1.	Addition	To find the sum or total of two or more numbers.
2.	Subtraction	To find the difference between two numbers.
3.	Multiplication	Repeated addition of a number. Also called 'product'
4.	Division	The process of calculating the number of times one number is contained in another.
5.	Divisible	Can be divided by a number without a remainder.

Multiplication methods

6.	Lattice	<div><div>24 x 13 = 312</div></div>												
7.	Grid	<div><div>Eg) 574 x 29</div><table><tr><td></td><td>500</td><td>70</td><td>4</td></tr><tr><td>20</td><td>10000</td><td>1400</td><td>80</td></tr><tr><td>9</td><td>4500</td><td>630</td><td>36</td></tr></table><div><div>11480</div><div>+ 5166</div><div>-----</div><div>16646</div><div>-----</div><div>Finished!</div></div></div>		500	70	4	20	10000	1400	80	9	4500	630	36
	500	70	4											
20	10000	1400	80											
9	4500	630	36											
8.	Column	<div><div><div><div><div><div>×</div><div>36</div></div><div><div>15</div></div></div><div><div>30</div><div>10</div></div></div><div><div>30</div><div>60</div><div>150</div><div>300</div></div><div><div>540</div></div></div><div><div>30</div><div>60</div><div>150</div><div>300</div></div><div><div>6</div><div>10</div><div>50</div><div>100</div></div><div><div>6</div><div>10</div><div>50</div><div>100</div></div></div>												

Division Methods

9.	Short	<p>e.g. $6497 \div 8$</p> 
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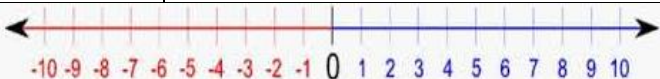
10.	Long	e.g. $13032 \div 24$	<div> <div>543</div> <div> 1 - 24 24 $\overline{)13032}$ 2 - 48 - 120 3 - 72 103 4 - 96 - 96 5 - 120 72 6 - 144 - 72 7 - 168 00 8 - 192 9 - 216 </div> </div>
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Times Tables

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Divisibility Rules

11.	A number is divisible		
	by:	if:	
	2	The last digit is divisible by 2	
	3	The sum of the digits is divisible by 3	
	4	The number made by the last two digits is divisible by 4	
	5	The last digit is 5 or 0	
	6	The number is divisible by 2 and 3	
	8	The number made by the last 3 digits is divisible by 8	
	9	The sum of its digits is divisible by 9	
	10	The last digit is 0.	
12.	Operations	Symbols and words to show how to combine numbers.	
		×	Multiply
		÷	Divide
13.	Inverse Operations	+ and – are inverse	
		× and ÷ are inverse	
		Finding the square root is the inverse of finding the square of a number.	
		Finding the cube root is the inverse of finding the cube of a number.	

14.	Order of operations	The order in which operations should be done.	B I DM AS	Brackets Indices Divide and Multiply Add and Subtract
15.	Negative number	A number that is less than zero.		
16.	Ascending order	A set of numbers arranged from smallest to biggest.		
17.	Descending order	A set of numbers arranged from biggest to smallest.		

Analysing and displaying data

Definitions

18.	Qualitative	Data described by words.
19.	Quantitative	Data that is in number form that can be discrete or continuous.
20.	Discrete	Data that can be counted and has a finite number of possible values.
21.	Continuous	Data that can be measured and has an infinite number of possible values within a range.

Averages and Measures of central tendency

22.	Mode	The value that occurs most often.
23.	Range	The largest value minus the smallest value.
24.	Median	The middle value when the numbers are in ascending order.
25.	Mean	Add up all the amount. Divide by how many values there are.

Averages from frequency tables

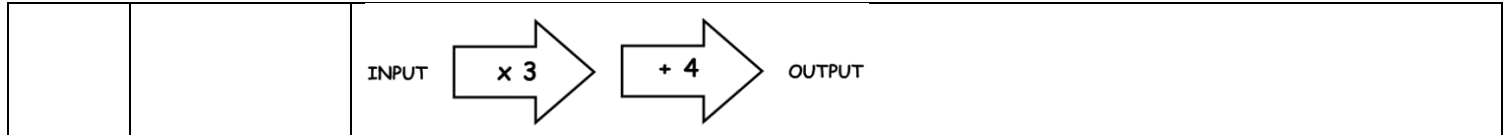
26.	Modal class	The class with the highest frequency																					
27.	Median	If the total frequency is n , then the median lies in the class with the $\frac{n+1}{2}$ th value in it.																					
28.	Mean from a frequency table <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> Times Add Divide </div> <div style="font-size: 2em;"> → ↓ ↓ ← </div> </div>	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"> <p style="margin: 0;">No of make-up items in handbags</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #FFD700;">No of Items x</th><th style="background-color: #FFD700;">Freq f</th><th style="background-color: #FFD700;">$f \times x$</th></tr> </thead> <tbody> <tr><td>1</td><td>7</td><td>$1 \times 7 = 7$</td></tr> <tr><td>2</td><td>2</td><td>$2 \times 2 = 4$</td></tr> <tr><td>3</td><td>1</td><td>$3 \times 1 = 3$</td></tr> <tr><td>4</td><td>4</td><td>$4 \times 4 = 16$</td></tr> <tr><td>5</td><td>2</td><td>$5 \times 2 = 10$</td></tr> <tr style="background-color: #FFD700;"><td colspan="2">16</td><td>40</td></tr> </tbody> </table> </div> <div style="background-color: #FFFF00; padding: 10px; margin-left: 20px;"> $\text{Mean} = \frac{40}{16} = 2.5$ </div> </div>	No of Items x	Freq f	$f \times x$	1	7	$1 \times 7 = 7$	2	2	$2 \times 2 = 4$	3	1	$3 \times 1 = 3$	4	4	$4 \times 4 = 16$	5	2	$5 \times 2 = 10$	16		40
No of Items x	Freq f	$f \times x$																					
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4	4	$4 \times 4 = 16$																					
5	2	$5 \times 2 = 10$																					
16		40																					

Displaying data

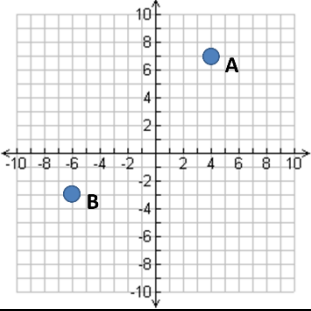
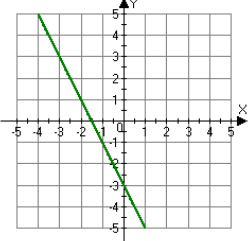
29.	Two way table	A table that can be used to compare two discrete data sets.	<p>What is your favorite sport to watch on television?</p> <table border="1"> <thead> <tr> <th></th><th>Football</th><th>Basketball</th><th>Baseball</th></tr> </thead> <tbody> <tr> <td>Males</td><td>40</td><td>22</td><td>15</td></tr> <tr> <td>Females</td><td>12</td><td>16</td><td>45</td></tr> <tr> <td>Total</td><td>52</td><td>38</td><td>60</td></tr> </tbody> </table>		Football	Basketball	Baseball	Males	40	22	15	Females	12	16	45	Total	52	38	60
	Football	Basketball	Baseball																
Males	40	22	15																
Females	12	16	45																
Total	52	38	60																
30.	Pictogram	A chart that uses pictures to represent quantities. Must include a key.	<p>Apples Sold</p> <p>Jan: 1 apple icon Feb: 4 apple icons Mar: 3 apple icons Apr: 2 apple icons</p> <p>1 full apple icon = 10 Apples, 1 half apple icon = 5 Apples</p>																
31.	Bar chart	A chart to display discrete data where the height of the bar shows the frequency.	<p>Favorite Type of Movie</p> <p>People</p> <p>Comedy Action Romance Drama SciFi</p>																
32.	Dual bar chart	A bar chart used to compare data sets where bars are drawn next to each other to compare heights.	<p>Rainfall in London and Bristol</p> <p>Rainfall (cm)</p> <p>Month</p> <p>London Bristol</p>																
33.	Composite bar chart	A bar chart where bars are split to show the different quantities within each bar.	<p>January February March</p> <p>Lime Cherry Blueberry</p>																

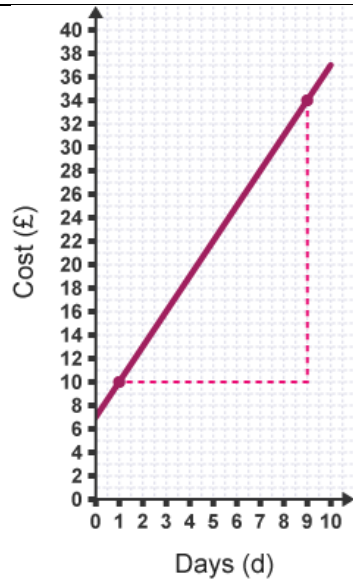
Expressions, functions and formulae

1.	Solve	<p>To find the answer/value of something</p> <p>Use inverse operations on both sides of the equation (balancing method) until you find the value for the letter.</p> <p>Solve $2x - 3 = 7$</p> <p>Add 3 on both sides</p> $2x = 10$ <p>Divide by 2 on both sides</p> $x = 5$
2.	Inverse	<p>Opposite</p> <p>The inverse of addition is subtraction. The inverse of multiplication is division.</p>
3.	Substitution	<p>Replace letters with numbers.</p> <p>Be careful of $5x^2$. You need to square first, then multiply by 5.</p> <p>$a = 3, b = 2$ and $c = 5$. Find:</p> <ol style="list-style-type: none"> $2a = 2 \times 3 = 6$ $3a - 2b = 3 \times 3 - 2 \times 2 = 5$ $7b^2 - 5 = 7 \times 2^2 - 5 = 23$
4.	Writing Formulae	<p>Substitute letter; for word; in the question.</p> <p>Replace letters with numbers.</p> <p>Be careful of $5x^2$. You need to square first, then multiply by 5.</p> <p>$a = 3, b = 2$ and $c = 5$. Find:</p> <ol style="list-style-type: none"> $2a = 2 \times 3 = 6$ $3a - 2b = 3 \times 3 - 2 \times 2 = 5$ $7b^2 - 5 = 7 \times 2^2 - 5 = 23$
5.	Function Machine	<p>Takes an input value, performs some operations and produces an output value.</p>



Graphs

1.	Coordinates	<p>Written in pairs. The first term is the x-coordinate (movement across). The second term is the y-coordinate (movement up or down)</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>A: (4,7)</p> <p>B: (-6,-3)</p> </div> </div>
2.	Linear Graph	<p>Straight line graph.</p> <p>The equation of a linear graph can contain an x-term, a y-term and a number.</p> <p>Example:</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Other examples:</p> <p>$x = y$</p> <p>$y = 4$</p> <p>$x = -2$</p> <p>$y = 2x - 7$</p> <p>$y + x = 10$</p> <p>$2y - 4x = 12$</p> </div> </div>
3.	Real Life Graphs	<p>Graphs that are supposed to model some real-life situation.</p> <p>The actual meaning of the values depends on the labels and units on each axis.</p> <p>The gradient might have a contextual meaning.</p> <p>The y-intercept might have a contextual meaning.</p> <p>The area under the graph might have a contextual meaning.</p>



A graph showing the cost of hiring a ladder for various numbers of days.

The gradient shows the cost per day. It costs £3/day to hire the ladder.

The y-intercept shows the additional cost/deposit/fixed charge (something not linked to how long the ladder is hired for). The additional cost is £7.