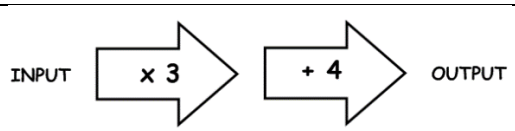
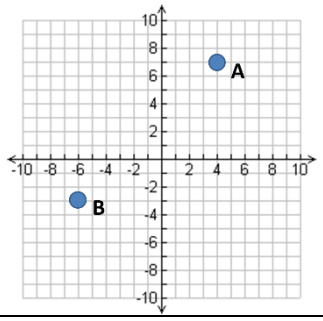
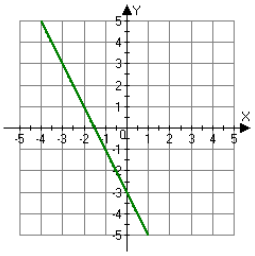
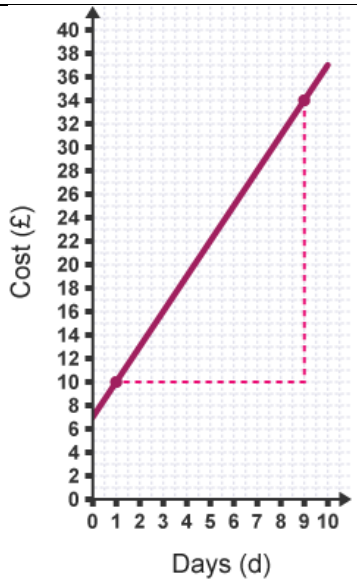
Year 7 Mathematics Developing Term 2

Expressions, functions and formulae

1.	Solve	To find the **answer**/value of something **Use inverse operations** on both sides of the equation (balancing method) until you find the value for the letter. Solve $2x - 3 = 7$ Add 3 on both sides $2x = 10$ Divide by 2 on both sides $x = 5$
2.	Inverse	**Opposite** The inverse of addition is subtraction. The inverse of multiplication is division.
3.	Substitution	**Replace letters with numbers.** **Be careful of $5x^2$. You need to square first, then multiply by 5.** **$a = 3, b = 2$ and $c = 5$. Find:** **1. $2a = 2 \times 3 = 6$** **2. $3a - 2b = 3 \times 3 - 2 \times 2 = 5$** **3. $7b^2 - 5 = 7 \times 2^2 - 5 = 23$**
4.	Writing Formulae	**Substitute letters for words** in the question. Replace letters with numbers. Be careful of $5x^2$. You need to square first, then multiply by 5. $a = 3, b = 2$ and $c = 5$. Find: 1. $2a = 2 \times 3 = 6$ 2. $3a - 2b = 3 \times 3 - 2 \times 2 = 5$ 3. $7b^2 - 5 = 7 \times 2^2 - 5 = 23$
5.	Function Machine	Takes an **input** value, performs some **operations** and produces an **output** value.

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

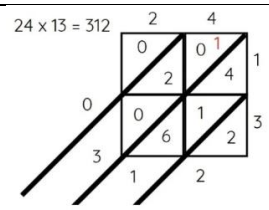
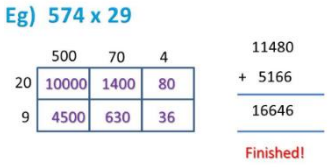
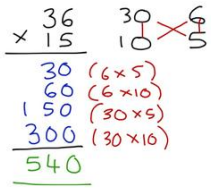
		 A graph showing the cost of hiring a ladder for various numbers of days. The gradient shows the cost per day. It costs £3/day to hire the ladder. The y-intercept shows the additional cost/deposit/fixed charge (something not linked to how long the ladder is hired for). The additional cost is £7.

Year 7 Mathematics Developing Term 3

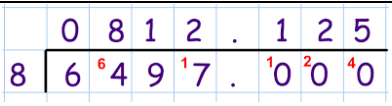
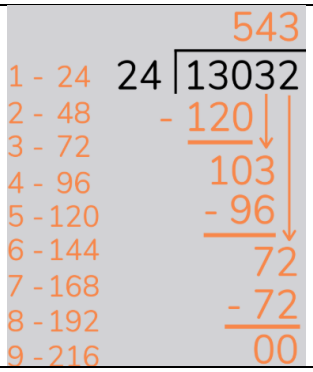
Factors and multiples

1.	Multiplication	Repeated addition of a number. Also called 'product'
2.	Division	The process of calculating the number of times one number is contained in another.
3.	Divisible	Can be divided by a number without a remainder.

Multiplication methods

4.	Lattice	
5.	Grid	
6.	Column	

Division Methods

7.	Short	e.g. 6497 ÷ 8	
8.	Long	e.g. 13032 ÷ 24	

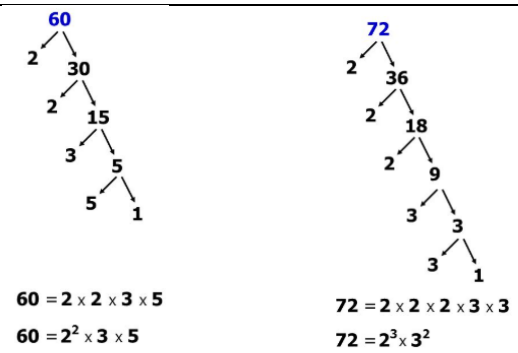
Times Tables

×	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

	A number is divisible	
	by:	if:
9.	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.

10.	Multiple	The result of multiplying a number by an integer.
11.	Factor	A number that divides into another number without a remainder.
12.	Prime number	A number with exactly two factors; 1 and itself.
13.	Prime numbers	2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.
14.	Product	The answer when two or more numbers are multiplied together.

15.	Prime factor decomposition	Writing a number as a product of its prime factors.		
16.	Highest common factor	HCF	The highest number that divides exactky into two or more numbers.	e.g. the HCF of 12 and 24 is 12
17.	Lowest common multiple	LCM	The smallest positive integer that is a multiple of two or more numbers.	e.g. the LCM of 12 and 24 is 24

Decimals and measures

1.	Decimal	A number with a **decimal point** in it. Can be positive or negative. $3.7, 0.94, -24.07$
2.	Recurring Decimal	A decimal number that has **digits that repeat forever**. The part that repeats is usually shown by placing a dot above the digit that repeats, or dots over the first and last digit of the repeating pattern. $\frac{1}{3} = 0.333 \ldots = 0.\dot{3}$ $\frac{1}{7} = 0.142857142857 \ldots = 0.\dot{1}42857\dot{}$ $\frac{77}{600} = 0.128333 \ldots = 0.128\dot{3}$
3.	Ascending order	A set of numbers arranged from smallest to biggest.
4.	Descending order	A set of numbers arranged from biggest to smallest.

5.	Metric System	A system of measures based on: - the metre for length - the kilogram for mass - the second for time **Length: mm, cm, m, km** **Mass: mg, g, kg** **Volume: ml, cl, l** $1 kilometres = 1000\ metres$ $1\ metre = 100\ centimetres$ $1\ centimetre = 10\ millimetres$ $1\ kilogram = 1000\ grams$
6.	Imperial System	A system of weights and measures originally developed in England, usually based on human quantities **Length: inch, foot, yard, miles** **Mass: lb, ounce, stone** **Volume: pint, gallon** $\mathbf{1lb = 16\ ounces}$ $\mathbf{1\ foot = 12\ inches}$ $\mathbf{1\ gallon = 8\ pints}$
7.	Metric and Imperial Units	Use the **unitary method** to convert between metric and imperial units. $5\ miles \approx 8\ kilometres$ $1\ gallon \approx 4.5\ litres$ $2.2\ pounds \approx 1\ kilogram$ $1\ inch = 2.5\ centimetres$