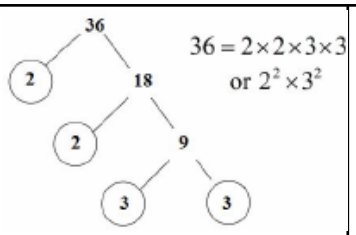
GCSE Mathematics - Unit 1: Number **Name:……..**

Topic/Skill	Definition	Example	Your Turn
1. Multiple	The result of multiplying a number by an integer. The **times tables** of a number.	The first five multiples of 7 are: $7, 14, 21, 28, 35$	Circle the multiples of 8: 1, 4, 8, 2, 24, 16
2. Factor	A number that **divides exactly** into another number without a remainder. It is useful to write factors in pairs	The factors of 18 are: $1, 2, 3, 6, 9, 18$ The factor pairs of 18 are: $1, 18$ $2, 9$ $3, 6$	Circle the factors of 8: 1, 4, 8, 2, 24, 16
3. Lowest Common Multiple (LCM)	The **smallest** number that is in the **times tables** of each of the numbers given.	The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables.	What is the LCM of 8 and 12?
4. Highest Common Factor (HCF)	The **biggest** number that **divides exactly** into two or more numbers.	The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly.	What is the LCM of 20 and 30?
5. Prime Number	A number with **exactly two factors**. A number that can only be divided by itself and one. The number **1 is not prime**, as it only has one factor, not two.	The first eight prime numbers are: $2, 3, 5, 7, 11, 13, 17, 19$	Find the next two prime numbers after 19
6. Prime Factor	A factor which is a prime number.	The prime factors of 18 are: $2, 3$	The prime factors of 24 are:
7. Product of Prime Factors '**Prime factorisation**'	Finding out which **prime numbers multiply** together to make the **original** number.		24

	Use a **prime factor tree.**		
8. Square Number	The number you get when you **multiply a number by itself**.	**1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225…** $9^2 = 9\times9 = 81$	**20^2=** **300^2=**
9. Square Root	The **number you multiply by itself** to get another number. The reverse process of squaring a number.	$\sqrt{36} = 6$ because $6\times6 = 36$	$\sqrt{16} =$ $\sqrt{100} =$
10. Cube Number	The number you get when you **multiply a number by itself and itself again**.	1, 8, 27, 64, 125… $2^3 = 2\times2\times2 = 8$	6^3= $20^{3=}$
11. Cube Root	The **number you multiply by itself and itself again** to get another number. The inverse process of cubing a number.	$\sqrt[3]{125} = 5$ because $5\times5\times5 = 125$	$\sqrt[3]{216} =$ $\sqrt[3]{1000} =$
12. Negative Number	A number that is **less than zero**. Can be decimals.	$-8, \ -2.5$	Write these numbers in **ascending** order (smallest to largest) 1 , -1, -7, 3, -1.5
13. Addition and subtraction with negatives	**Add positive** number is same as **add** + + means + **Subtract positive** number is same as **subtract** **-** + means **-** **Add negative** number is same as **subtract** + **-** means **-**		**1 + 3 =** **1 – 3 =** **1 + - 3 =**

	Subtract negative number is same as **add** **- -** means **+**		**1 - - 3=**
13. Multiplication and division with negatives	**positive × positive = positive** positive ÷ positive = positive **positive × negative = negative** positive ÷ negative = negative **negative × positive = negative** negative ÷ positive = negative **negative × negative = positive** negative ÷ negative = positive		**4 x 2 =** 4 ÷ 2 = **4 x -2 =** 4 ÷ -2 = **-4 x 2 =** -4 ÷ 2 = **-4 x -2 =** -4 ÷ -2 =
14. BODMAS/ BIDMAS (Order of Operations)	**Brackets** then **Powers** (BO/BI) comes first. **Multiplication** then **Division** (DM) comes next. **Addition** then **Subtraction** (AS) comes last.	3 + **4 × 2** = 11 (do the multiplication first) 3 + (**4+ 1**) ² Brackets: (5) ² = 25 and then add 3 = 28 **12 ÷ 2** – 3 = 3 (division first!)	7 – 3 x 2 = 7 x 3 – 2 = 7 x (3 – 2) = 7 x $(3-2)^2$ = 7 – 2 + 3 x 5 =
15. Estimate	Round each number in the calculation to **1 significant figure.** ≈ means 'approximately equal to'	$\frac{348+692}{2.103} \approx \frac{300+700}{2}$ $= 500$	3.7 +4.2 ≈ 31.7 – 4.199≈ 31.7001 x 4.4999≈ 31.9 ÷ 4.901≈
16. Multiplication Index Law	When **multiplying** with **the same base** (number or letter), **add the powers**. $a^m \times a^n = a^{m+n}$ **Remember:**	$7^5 \times 7^3 = 7^8$ $a^{12} \times a = a^{13}$ $x^3 \times y^2 = x^3 y^2$	$11^3 \times 11^{12} =$ $11^2 \times 12^2 =$ $a^2 \times a =$ $a^2 \times b^7 =$

	1) The base has to be the same 2) The coefficient is not the same as the base	(You can't simplify.) $4x^5 \times 2x^8 = 8x^{13}$ (Multiply the coefficients, add the powers)	$3x^5 \times 2x^8 =$ $2x^2 \times 3xy =$
17. Division Index Law	When **dividing** with the same base (number or letter), **subtract the powers**. $a^m \div a^n = a^{m-n}$	$15^7 \div 15^4 = 15^3$ $x^9 \div x^2 = x^7$ $20a^{11} \div 5a^3 = 4a^8$ For coefficients use the same rules as with multiplication.	$19^6 \div 11^2 =$ $2^9 \div 2^3 =$ $a^{15} \div a^3 =$ $24a^{12} \div 6a^3 =$ $30a^4b^3 \div 5ac =$
18. Brackets Index Laws	When raising a power to another power, multiply the powers together. $(a^m)^n = a^{mn}$ Remember base and coefficient are different.	$(y^2)^5 = y^{10}$ $(6^3)^4 = 6^{12}$ $(5x^6)^3 = 125x^{18}$	$(y^3)^2 =$ $(5^2)^5 =$ $(6x^4)^2 =$
19. 'Special' Powers	$p = p^1$ They are the same thing! Just like x means $1x$. $p^0 = 1$ Anything to the power of zero is 1! Apart from 0^0, which we don't know!	$99999^0 = 1$ $99999^1 = 99999$	$20^1 =$ $32^0 =$ $\left(\frac{1}{2}\right)^1 =$ $90.2^0 =$
20. Negative Powers	A negative power is the reciprocal of the positive power. $a^{-m} = \frac{1}{a^m}$	$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$	$4^{-3} =$