MATHS – YEAR 8 – Unit 7 Properties of Numbers

1. Tier 3 Vocabulary	
Estimate	To find a value close to the actual answer to check the accuracy of calculations
Counter Example	An example that disproves a statement (shows it is false)
Square Number	The number we get after multiplying number by itself
Square Root	A square root of a number is a value that, when multiplied by itself, gives the number.
Cube Number	The number we get after multiplying number by itself three times
Demonstrate	establish the validity of something, as by using an **example**
Justify	To lay ou the mathematical thought process step by step, so that the line from the starting point to the ending point is connected
Proof	Logical mathematical arguments used to show the truth of a mathematical statement.

2. Numerical Reasoning – Prime Numbers	
Negative Numbers	Less than zero. (Positive means more than zero. Zero is neither negative nor positive.) A negative number is written with a minus sign in front
Prime Numbers	Whole numbers that only have **two** factors. The number itself and 1. 1 is not a Prime number
Reasoning	**Mathematical reasoning** involves thinking through **mathematical** problems logically in order to arrive at solutions. It also involves being able to identify what is important and unimportant in solving a problem and to **explain** or justify a solution

3. Numerical Reasoning – Estimating
Round each component of the calculation to one significant figure. Perform the calculation with these rounded values

4. Command Words	
Estimate the value of (used with a calculation)	Use approximations to work out a value. Unless told otherwise, students should round the given values to 1 significant figure.
Show that…	Give every step of a process that will lead to the required outcome.
Factorise (fully)	Take out any common factors of an expression or convert a quadratic expression into two linear factors. This should always be done fully, even if that word is absent from the instruction. Use of the word 'fully' is a hint that more than one factor can be taken out.
Why	Give a calculation and/or written evidence to support the given statement.
Solve	Find the value(s) that satisfy a given equation or inequality.
Construct	Draw accurately. If told to use compasses, all construction arcs and lines should be shown.

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5. History

The Rhind Mathematical Papyrus, from around 1550 BC, has Egyptian fraction expansions of different forms for prime and composite numbers. However, the earliest surviving records of the explicit study of prime numbers come from ancient Greek mathematics. Euclid's Elements (c. 300 BC)

Negative numbers appear for the first time in history in the Nine Chapters on the Mathematical Art (Jiu zhang suan-shu), which in its present form dates from the period of the Han Dynasty (202 BC – AD 220). During the 7th century AD, negative numbers were used in India to represent debts. The Indian mathematician Brahmagupta, in Brahma-Sphuta-Siddhanta (written c. AD 630), discussed the use of negative numbers. He called positive numbers "fortunes", zero "a cipher", and negative numbers "debts"

7. Numerical Reasoning – Prime Numbers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

6. Numerical Reasoning– Operations with Negative Numbers

Adding	When you add a negative number it is the same as subtracting a number of the same size. e.g. 6 + -5 = 6 - 5
Subtracting	When you subtract a negative number it is the same as adding a number of the same size. e.g. 6 - -5 = 6 + 5
Multiplying and Dividing	Multiplying or dividing a positive number by a negative number results in a negative answer Multiplying or dividing a negative number by a negative number results in a positive answer

8. Geometrical Reasoning - Perimeter

Highest Common Factor (HCF)	The largest number that is a factor of two (or more) other numbers. When we find all the factors of two or more numbers, and some factors are the same ("common"), then the largest of those common factors is the Greatest Common Factor.
Lowest Common Multiple (LCM)	The smallest positive number that is a multiple of two or more numbers.