Vandyke Upper School Numeracy Booklet

Addition/Subtraction

Skill	Example	Suggested Strategy	Helpful Hints
Column Addition	38 + 26 = 64	38 26+ 64 ¹	Start at the right adding the units. Remember to carry over the tens, hundreds etc.
Column Subtraction	188 – 65 = 123	188 65- 123	Remember if the bottom digit is larger than the top digit to borrow from the next column.

Multiplication

Skill	Example	Suggested Strategy	Helpful Hints
Mental Multiplication	6 x 8 = 48	Learn your tables	LEARN YOUR TABLES!!
Box Method	123 x 15 = 1845	<table><tr><th>X</th><th>100</th><th>20</th><th>3</th></tr><tr><td>10</td><td>1000</td><td>200</td><td>30</td></tr><tr><td>5</td><td>500</td><td>100</td><td>15</td></tr></table> Add together highlighted amounts to get answer 1000+200+30+500+100+15=1845	

Division

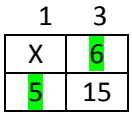
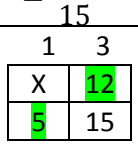
Skill	Example	Suggested Strategy	Helpful Hints
Mental Division	63 ÷ 7 = 9	Reverse the calculation 7 x what = 63	LEARN YOUR TABLES!!
Bus Shelter Method	129 ÷ 6 = 21.5	21. 5 6)1¹29.³0	1 is not divisible by 6 so carry to next digit 12 ÷ 6 = 2 no remainder 9 ÷ 6 = 1 remainder 3 so add a decimal point above and below bus shelter and add a 0 carry the remainder 3 to the 0 30 ÷ 6 = 5

Decimals

Skill	Example	Suggested Strategy	Helpful Hints
Adding Decimals	19.2 + 3.5 = 22.7	Use column addition method 19.2 3.5+ 22.7	Keep decimal points in line
Subtracting Decimals	27.3 – 6.1 = 21.2	Use column subtraction method 27.3 6.1- 21.2	Keep decimal points in line
Multiplying Decimals	0.02 x 3.6 = 0.072	Count up the total number of decimal places – in this case there are 3 Ignore the decimal places and multiply the numbers 2 x 36 = 72 We need 3 decimal places in the answer so start from the right and move left by the number of places required. In this case 0.072.	Use standard multiplication technique and learn tables

Dividing Decimals	3.2 ÷ 0.08 = 40	Change the question by multiplying both numbers by 10, 100, 1000 ... 3.2 ÷ 0.08 becomes 320 ÷ 8	You need to be able to divide by a whole number, not a decimal.

Fractions

Skill	**Example**	**Suggested Strategy**	**Helpful Hints**
Simplifying Fractions	Simplify $\frac{24}{48}$	Keep dividing! Find a common factor and keep dividing top and bottom numbers by it. In this example ÷ by 4 to obtain $\frac{6}{12}$, now ÷ by 6 to obtain $\frac{1}{2}$	Divide the numerator (top number) and denominator (bottom number) by the highest common factor. In this example the highest common factor is 24.
Adding fractions	$\frac{2}{5}+\frac{1}{3}$	 Add the two shaded boxes to get the numerator, the denominator is the number in the unshaded box. Simplify as required. $\frac{6+5}{15}=\frac{11}{15}$	Find a common denominator and find the equivalent fraction. In this case a common denominator is 15 so $\frac{2}{5}\times\frac{3}{3}=\frac{6}{15}$ and $\frac{1}{3}\times\frac{5}{5}=\frac{5}{15}$ so $\frac{6}{15}+\frac{5}{15}=\frac{11}{15}$
Subtracting fractions	$\frac{4}{5}-\frac{1}{3}$	 Subtract the relevant numbers in the two shaded boxes to get the numerator, the denominator is the number in the unshaded box. Simplify as required. $\frac{12-5}{15}=\frac{7}{15}$	Find a common denominator and find the equivalent fraction. In this case a common denominator is 15 so $\frac{4}{5}\times\frac{3}{3}=\frac{12}{15}$ and $\frac{1}{3}\times\frac{5}{5}=\frac{5}{15}$ so $\frac{12}{15}-\frac{5}{15}=\frac{11}{15}$
Multiplying fractions	$\frac{2}{3}\times\frac{1}{4}$	Multiply top numbers to create numerator and multiply bottom numbers to create denominator. Simplify as necessary. $\frac{2\times1}{3\times4}=\frac{2}{12}=\frac{1}{6}$	Simplify answers wherever possible.
Dividing fractions	$\frac{1}{4}\div\frac{3}{8}$	Flip the second fraction and change sign to X and multiply as above $\frac{1}{4}\div\frac{3}{8}=\frac{1}{4}\times\frac{8}{3}=\frac{8}{12}=\frac{2}{3}$	Simplify answers wherever possible.
Improper fractions	$\frac{17}{8}$	Divide numerator by the denominator to find the "whole numbers" and leave the remainder as a fraction. $17\div8=2\ remainder\ 1$ this is written as $2\frac{1}{8}$	Simplify answers wherever possible.
Fraction of an amount	$\frac{2}{7}$ of 42	Divide the given amount by the denominator then multiply the result by the numerator. $42\div7=6,$ $6\times2=12$	So $\frac{2}{7}$ of 42 is 12

Percentages

Skill	Example	Suggested Strategy	Helpful Hints
Working out percentage of amount (non-calculator)	16% of 160	Use the "chunking" method. 10% is 160÷10 = 16 5% is 10%÷2 = 8 1% is 10%÷10 = 1.6 16% of 160 is 16 + 8 + 1.6 = 25.6	Finding 10%, 5% and 1% will enable you to find any % required.
Working out percentage of amount (calculator)	Calculate 36% of 128	Divide the amount given by 100 and multiply by the percentage required. 128÷100 = 1.28 1.28 x 36 = 46.08	"Percent" means "per hundred", so 36% is 36 out of 100.

Factors, Multiples & Sequences

Skill	Example	Suggested Strategy	Helpful Hints
Listing factors of a number	List factors of 60	Factors come in pairs and are numbers that when multiplied together equal the given number 1x60 =60, 2x30=60, 3x20=60, 4x15=60, 5x12=60, 6x10=60 Factors of 60 are: 1, 2, 3, 4, 5, 6, 10,12,15,20,60	Remember squared numbers have a factor multiplied by itself. Factors of 16: 1,2,4,8,16 since 4x4=16
Common factors	Common factors of 60 and 16	List factors as above and note any factors that appear in both lists. Factors of 60 are: 1, 2, 3, 4, 5, 6, 10,12,15,20,60 Factors of 16: 1,2,4,8,16 Common factors: 1, 2, 4	
Listing multiples of a number	First eight multiples of 3 and 4	List the first 8 terms in the times tables: Multiples of 3: 3,6,9,12,15,18,21,24 Multiples of 4: 4,8,12,1,6,20,24,28,32	LEARN YOUR TABLES!!
Common multiples	Common multiples of 3 and 4	List multiples that appear in both times tables: 12, 24,36, ...	LEARN YOUR TABLES!!
Common sequences, square numbers	Evaluate 3^2	Square numbers are found by multiplying a number by itself: 3^2=3x3=9	Evaluate means "work out the value of"
Common sequences, cube numbers	Write down the fourth cube number	Cube numbers are found by multiplying a number by itself, and then again: 4^3=4x4x4=64	Don't confuse 4^3 with 4 x 3.

Negative Numbers

Skill	Example	Suggested Strategy	Helpful Hints
Adding a negative	2 + -4	Adding a negative is the same as subtracting a positive: 2 + -4 = 2 – 4 = -2	Negative changes the sign next to it.
Subtracting a negative	2 - -4	Subtracting a negative is the same as adding a positive: 2 - -4 = 2 + 4 = 6	Negative changes the sign next to it.

Multiplying by a negative	2 x -3 -4 x -5	Ignore the negatives and do the multiplication. If there are an odd number of negatives in the question the answer will be negative: 2 x -3 = -6 If there an even number of negatives in the question the answer will be positive: -4 x -5 = 20	Count the negatives in the question. Two negatives "cancel" each other to become positive.
Dividing by a negative	63 ÷ -7 -39 ÷ -3	Ignore the negatives and do the division. If there are an odd number of negatives in the question the answer will be negative: 63 ÷ -7 = -9 If there an even number of negatives in the question the answer will be positive: -39 ÷ -3= 13	Count the negatives in the question. Two negatives "cancel" each other to become positive.

Ratio

Skill	**Example**	**Suggested Strategy**	**Helpful Hints**
Dividing a quantity into a ratio	Divide £72 in the ratio 5:4	Add the number of parts in the ratio (5 + 4 = 9 parts) 9 parts = £72 1 part = £8 (£72 ÷ 9 parts = £8) 5 parts = £40 (£8 x 5 = £40) 4 parts = £32 (£8 x 4 = £32) £40 : £32	**Always find one part first.** Your answers should add up to the initial amount: £40 + £32 = £72 Remember to use any units given in the question; £, Kg, cm etc.

Averages

Skill	**Example**	**Suggested Strategy**	**Helpful Hints**
Mean	Find the ,mean of 2,4,4,8,10,20	Add the values together: 2+4+4+8+10+20=48 Divide by the number of values: In this case 48 ÷ 6 = 8	Add values together and divide by the number of parts
Mode	Find the mode of 2,4,4,6,10,18,20	Put the values in numerical order, the mode is the most common number 2,4,4,6,10,18,20 Mode is 4	There may be more than one modal value.
Median	Find the median values of 2,4,4,6,10,18,20 and 2,4,4,6,8,9,18,20	If there are an odd number of values, put the values in numerical order, the median is the middle value 2,4,4,6,10,18,20 median is 6 If there is an even number of values, put the values in order and the median is halfway between the two middle values. 2,4,4,6,8,9,18,20: median is 7	Put the values in numerical order
Range	Find the range of 3,4,4,6,10,18,29	The range is the difference between the highest and lowest values; 29 – 3 = 26	Put the values in numerical order.