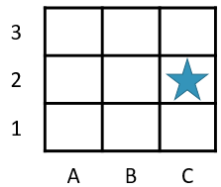
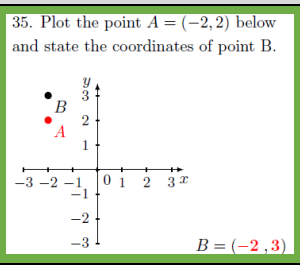
SANDRINGHAM COLLEGE

Key:

- Entry level skills that may need to be explicitly taught
- These are the essential skills to be explicitly taught
- Enrichment skills to be explicitly taught to the students who have the prerequisite skills

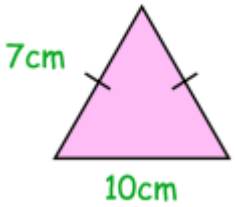
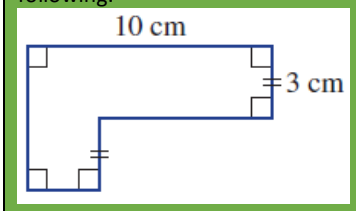
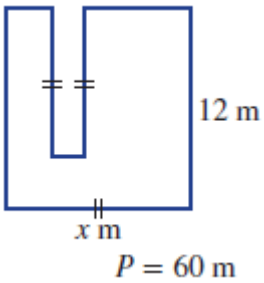
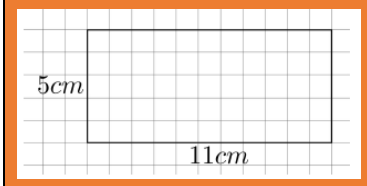
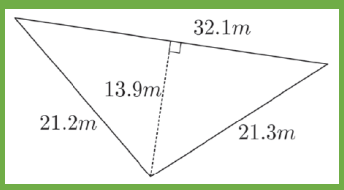
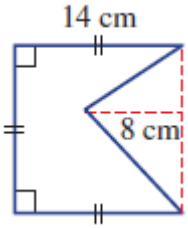
Topic 1 – Integers and Algebra

		Entry	Core	Enrichment
1	**Adding and Subtracting Integers**	1A Can add and subtract positive integers, answers between 0 and 10	1B Adding and subtracting positive integers, answers between -10 and 10	1C Adding and subtracting negative integers, answers between-10 and 10
	Examples	Show how a number line can be used to calculate $3 + 5$	$-3 + 5$ $-2 - 4$ $3 - 8$	$-3 + {}^{-}5$ $-2 - {}^{-}4$ $3 - {}^{-}8$
	Application Questions – Skill 1			
2	**Order of operations**	2A Can calculate sums involving the four basic operations	2B Can show step by step working out for order of operation questions involving two basic operations	2C Can calculate with more complex operations (powers, square roots and factorials) and apply these within order of operation questions.
	Examples	Calculate $3 + 5, 17 - 5, 3 \times 12, 14 \div 2$	Calculate $5 \times (3 + 4)$ showing line by line working	Calculate $\sqrt{3! - 2^2}$ showing line by line working
	Application Questions – Skill 2			
3	**Substituting into an algebraic expression**	3A Substituting into a one-step expression involving addition and subtraction	3B Substituting into a one-step expression involving multiplication and division	3C Substituting into any two-step expression, involve all four operations
	Examples	Substitute $x = 12$ into the following expressions and evaluate $x + 3$ $x - 4$	Substitute $x = 12$ into the following expressions and evaluate $2x$ $\frac{x}{3}$	Substitute $x = 10$ and into the following expressions and evaluate $\frac{x}{2} - 7,\ \frac{2+x}{6},\ 3(x-4),\ 2 + 3x$
	Application Questions – Skill 3			
4	**Solving an algebraic equation**	4A Solving a one-step equations involving addition and subtraction, showing use of an opposite operation	4B Solving a one-step equation involving multiplication and division, showing use of an opposite operation	4C Solve a two-step equation showing line by line working out
	Examples	Solve the following showing your use of an opposite operation $x + 3 = 10$ $x - 4 = 10$	Solve the following showing your use of an opposite operation Solve $2x = 10,\ \frac{x}{4} = 10$	Solve the following, by first writing an equivalent one step equation $3x + 2 = 18,\quad 9 = \frac{4+x}{3}$
	Application Questions – Skill 4			
5	**Plotting coordinates**	5A Can state grid references.	5B Plot and label points in the Cartesian plane	5C Translations and reflections of points in the Cartesian plane.
	Examples	What is the grid reference of the star 		Reflect the point $A = (-1,3)$ in the x-axis. Translate the point $A = (-1,3)$ 2 units to the left.
	Application Questions – Skill 5			

Topic 2 - Decimals

		Entry	Core	Enrichment
1	**Decimal Place Value**	1A State the place value of a digit in a decimal	1B Round decimals to a give number of decimal places	1C Compare decimals using <, = or >
		What is the place value of the 9 in 12.963?	Round 0.078 to 2 decimal places (2 dp.)	Insert <, = or > between the decimals and, if possible, circle the biggest. $0.038 \quad 0.04$
2	**Multiplying and dividing decimals by 10 and 100**	2A Multiply and divide whole numbers by 10	2B Multiply and divide decimals numbers by 10	2C Multiply and divide decimal numbers by 100 and other powers of 10
	Examples	Calculate 14×10 Calculate $1400 \div 10$	Calculate 1.4×10 Calculate $1.4 \div 10$	Calculate 1.4×100 Calculate $1.4 \div 100$ Calculate $1.4 \div 10^3$ Calculate $1.4 \div\times 10^3$
	Skill 1&2 Applications			
3	**Using the addition and subtraction algorithm**	3A Part 1. Using the addition algorithm to add large whole numbers 3A Part 2. Using the subtraction algorithm to find the difference between large whole numbers	3B Adding and subtracting decimal numbers	3CUsing the addition and subtraction algorithm to add and subtract large negative numbers.
	Examples	Part 1: Calculate $432 + 2085$ Part 2: Calculate $2185 - 632$	Calculate $5.8 - 1.57$	$462 + {}^{-}1052$ $462 - {}^{-}1052$ $-462 + {}^{-}1052$
	Skill 3 Applications			
4	**Using the multiplication algorithm**	4A Using the multiplication algorithm to multiply by a single digit number	4B Using the multiplication algorithm to multiply two decimals ("single digit")	4C Using the multiplication algorithm to multiply two decimals ("two- digit")
	Examples	Calculate 9×395	Calculate 5.9×0.2	Calculate 5.19×1.2
	Skill 4 Applications			
5	**Using the division algorithm**	5A Calculate divisions with remainders (supported by a multiplication grid if needed)	5B Using the division algorithm to divide by a single digit number	5C Part 1: Divide by a decimal number 5C Part 2: Solving equations involving decimals
	Examples	Calculate $14 \div 3$	Calculate $6144 \div 3$	Part 1: Calculate $2.85 \div 0.6$ Part 2: Solve the following $3x + 5 = 14.1$ $0.92 = \frac{2+x}{7}$
	Skill 5 Applications			
6	**Percentage of a Number**	6A Converting a percentage to a decimal	6B Calculating the percentage of a number (whole number percentage, less than 100)	6C Calculating the percentage of a number (could include decimals or values greater than 100%)
	Examples	Convert 34% to a decimal Convert 7% to a decimal	Calculate 15% of 32	Calculate 96.7% of 0.2 Calculate 5.8% of 1600
	Skill 6 Applications			

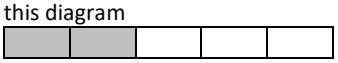
Topic 3 - Measurement

		Entry	Core	Enrichment
1	**Perimeter**	1A Can calculate the perimeter of a shape where dashes are used to indicate lines of equal length	1B Can calculate the perimeter of a shape where some lengths aren't given explicitly	1C Can determine a missing length of a complex shape by creating and solving an equation.
		Calculate the perimeter of the following 	Calculate the perimeter of the following. 	Determine the value of x by creating and solving an appropriate equation. 
2	**Area**	2A Can calculate the area of a rectangle on a grid	2B Can calculate the area of any rectangle, parallelogram or triangle	2C Can calculate the area of composite shapes, showing appropriate line by line working.
	Examples	Calculate the area of the rectangle below. 	Calculate the area of the following. 	Calculate the area of the following. Include appropriate line by line working. 
Skill 1 and 2 Applications				

Topic 4 – Number Properties

		Entry	Core	Enrichment
1	**Powers of numbers**	1A Can calculate squares of numbers using a multiplication grid	1B Can evaluate powers of numbers within times tables	1C Can substitute into expressions involving powers
		Calculate 3^2 using a multiplication grid for support	Calculate 2^5, Calculate 1^7 Calculate 7^2	Substitute $a = 3$ into $4a^2$ and evaluate.
Skill 1 Applications				
2	**Factors and multiples**	2A Can list positive multiples of a number	2B Part 1: Missing number questions 2B Part 2: Can list the factors of a number under 60	2C Can list factors of numbers larger than 100
	Examples	List the first 5 positive multiples of 7	Part 1: fill in the missing numbers $3 \times \square = 72$ Part 2: List the factors of 24	List the factors of 345
Skill 2 Applications				
3	**Classifying numbers**	3A Can classify numbers as even or odd. Can use a multiplication grid to identify square numbers.	3B Can classify numbers as prime, or multiples of 2, 3, 4 or 5	3C Can write the prime factorisation of a whole number
	Examples	Is 51 odd or even? Is 50 a square number?	Which words classify 50: Prime, square, odd, even, multiple of 4?	Write 60 as a product of prime numbers by splitting products.
Skill 3 Applications				
4	**LCM and HCF**	4A Can work out the LCM of two numbers by listing multiples of each	4B Can work out the HCF of two numbers by listing factors of each	4C Using prime factorisations to find LCM and HCF of larger numbers
	Examples	List the first 10 positive multiples of 8 and 6. Use these lists to identify the lowest common multiple of 6 and 8.	List all factors of 24 and 60. Use these lists to identify the highest common factor of 24 and 60.	$2016 = 2^5 \times 3^2 \times 7$ and $72 = 2^3 \times 3^2$ Using this information, a. state the LCM of 2106 and 72 b. state the HCF of 2106 and 72
5	**Square roots**	5A/5B Skill A and B to merge into one lesson Can calculate the square root of a number (using a multiplication grid for support if needed)		5C Identifying perfect squares and cubes from prime factorisation. Calculating roots of large numbers using prime factorisation
	Examples	Calculate $\sqrt{16}$ using a multiplication grid for support	Calculate $\sqrt{36}$	$324 = 2^2 \times 3^4$ Use this information to work out $\sqrt{324}$
Skill 4 and 5 Applications				

Topic 5 - Fractions

		Entry	Core	Enrichment
1	**Fraction Representations and Equivalence**	1A Can identify a fraction from a shaded rectangle	1B Can calculate equivalent fractions	1C Can convert between whole numbers, mixed numbers and improper fractions
	Examples	What fraction is represented in this diagram 	Fill in the box to create an equivalent fraction $\frac{8}{9}=\frac{\square}{27}$	Fill in the boxes to make each equation true $7=\frac{\square}{3}$ $2\frac{1}{3}=\frac{\square}{3}$ $\frac{8}{3}=\square\frac{\square}{3}$
2	**Simplifying fractions**	2A Can simplify fractions where only 2 or 5 is the common factor	2B Can simplify fractions [Possibly with the support of a calculator for IG4]	2B Can compare fractions with different denominators
	Examples	Simplify $\frac{8}{10}$	Simplify $\frac{12}{30}$ without using a calculator	Put a $<$, $=$ or $>$ between the fractions and, if possible, circle the biggest fraction. $\frac{3}{4}$ $\frac{9}{15}$
Application Questions Skills 1&2				
3	**Fractions, percentages and decimals**	3A Can convert between fractions and decimals where numerator is a whole number and denominator is 10 or 100	3B Can convert between fractions, decimals and percentages where the percentage equivalent is a whole number between 1 and 100	3C Can convert fractions to recurring decimals
	Examples	Convert $\frac{3}{10}$ to a decimal. Write 0.07 as a fraction	Complete the table below P | F | D | | 0.16	Express $\frac{3}{11}$ as a recurring decimal
Application Questions Skills 3				
4	**Adding and subtracting fractions**	4A Can add and subtract fractions with the same denominator	4B Can add and subtract fractions with a related denominator, then extend this to unrelated denominator	4C Can add and subtract fractions involving negative numbers
	Examples	Calculate $\frac{3}{8}+\frac{2}{8}$	Calculate $\frac{3}{4}+\frac{1}{8}$ Calculate $\frac{5}{6}-\frac{1}{8}$	Calculate $\frac{3}{5}-\frac{7}{6}$
Application Questions Skills 4				
5	**Multiplying fractions**	5A Can multiply fractions where cancelling/simplifying isn't required	5B Can multiply fractions, preferably using cancelling	5C Can multiply fractions where cancelling is required
	Examples	Calculate $\frac{3}{8}\times\frac{2}{7}$	Calculate $\frac{5}{8}\times\frac{3}{10}$	**Calculate** $\frac{42}{8}\times\frac{24}{189}$
Application Questions Skills 5				
6	**Dividing fractions**	6A Can divide fractions where cancelling/simplifying isn't required **there are no separate notes for these, just questions**	6B Can divide fractions	6C Part 1: Can use the four operations with mixed numbers 6C Part 2: Can solve equations involving fractions
	Examples	Calculate $\frac{3}{8}\div\frac{7}{2}$	Calculate $\frac{5}{8}\div\frac{10}{3}$	Part 1: Calculate $3\frac{1}{3}-2\frac{3}{10}$ Calculate $3\times2\frac{3}{10}$ Calculate $2\frac{3}{10}\div3$ Part 2: Solve the following $3x-5=\frac{3}{7}$
Application Questions Skills 6				

Topic 6 - Statistics

<table>
<tr><th></th><th></th><th>Entry</th><th>Core</th><th>Enrichment</th></tr>
<tr><td>1</td><td>Summary statistics</td><td>1A Can identify the largest and smallest values of a set of data and use this to calculate the range. Can identify the most commonly occurring value in a data set as the mode</td><td>1B Can determine the mean and median of a data set</td><td>1C Can list sets of numbers satisfying given properties of mean, median, mode and or range</td></tr>
<tr><td></td><td>Examples</td><td>Determine the range and mode of the following data set:
3, 6, 4, 0, 4, 4</td><td>Calculate the mean and median of the following data set:
3, 6, 4, 0, 4, 4</td><td>List all sets of three positive whole numbers such that
Mean = 5
Median = 7
Range = 6</td></tr>
<tr><td>2</td><td>Data displays</td><td>2A Bar charts</td><td>2B Stem and leaf plots</td><td>2C Back to back stem and leaf plot</td></tr>
<tr><td></td><td>Examples</td><td>Construct a bar chart for the data collected below:
<table><tr><td>Type of Pets</td><td>Frequency</td></tr><tr><td>Dog</td><td>6</td></tr><tr><td>Cat</td><td>4</td></tr><tr><td>Fish</td><td>2</td></tr><tr><td>Rabbit</td><td>0</td></tr><tr><td>Other</td><td>1</td></tr><tr><td>None</td><td>4</td></tr></table></td><td>Construct a stem and leaf plot for the temperatures below:

13, 16, 16, 20, 20, 21, 22, 25, 25, 26, 28, 29, 30, 32</td><td>Construct a back to back stem and leaf plot for the data below:
<table><tr><td>Girls heights (cm)</td><td>Boys heights (cm)</td></tr><tr><td>121, 123, 126, 132, 133, 134, 138, 140, 144, 145, 146, 147, 151, 160, 162, 173</td><td>138, 143, 144, 147, 149, 150, 151, 152, 154, 156, 162, 163, 166, 168</td></tr></table></td></tr>
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