

N5 Mathematics Course outline

August - September

Mathematics (National 5)			
Timing	Topic	Content	Websites
S4 N5 Numeracy			
2 weeks	Graphs and Charts	<ul style="list-style-type: none"> ◆ a table with at least five categories of information ◆ a chart where all the values are not given or where the scale is not obvious, eg comparative/compound bar chart ◆ a graph where part of the axis is missing or the scale is not obvious, eg conversion line graph ◆ a diagram, eg stem and leaf, scatter diagram or a map 	Stem & Leaf: https://www.mathsisfun.com/data/stem-leaf-plots.html Scatter diagram: https://www.mathsisfun.com/data/scatter-xy-plots.html
1 week	Make and justify decisions using data	<ul style="list-style-type: none"> ◆ make decisions based on patterns, trends or relationships in data ◆ use evidence from the interpretation of data to justify decisions ◆ understand the effects of bias and sample size 	
1 week	Make and justify decisions using probability	<ul style="list-style-type: none"> ◆ recognise patterns, trends and relationships and use these to state the probability of an event happening ◆ use evidence from the interpretation of probability to justify decisions ◆ analyse the probability of combined events, identifying the effects of bias and describing probability through the use of percentages, decimal fractions, fractions and ratio to make and justify decisions 	Comparing Probabilities (fractions): https://www.youtube.com/watch?v=WqnXhCEgW20 Comparing Probabilities (decimals): https://www.youtube.com/watch?v=00IQay8YJns
September N5 Numeracy Assessment Part B			

N5 Mathematics Course outline

September - November

Timing	Topic	Content	Resources
Applying numerical skills to simplify surds/ expressions using the laws of indices			
1 week	Working with surds	<ul style="list-style-type: none"> ◆ Simplification ➤ Rationalising denominators 	https://www.bbc.com/bitesize/guides/z9jtw6f/revision/1 (3 sections)
1 week	Simplifying expressions using the laws of indices	<ul style="list-style-type: none"> ◆ Multiplication and division using positive and negative indices including fractions ◆ Calculations using scientific notation ➤ $(a^m)^n = a^{mn}$ 	https://www.bbc.com/bitesize/guides/zqtv6yc/revision/1 (6 sections) Video: https://www.bbc.com/bitesize/clips/z84nvcw
Applying algebraic skills to manipulate expressions			
1 week	Working with algebraic expressions involving expansion of brackets	<ul style="list-style-type: none"> ◆ $a(bx + c) + d(ex + f)$ ◆ $ax(bx + c)$ ◆ $(ax + b)(cx + d)$ ➤ $(ax + b)(cx^2 + dx + e)$ where a, b, c, d, e, f are integers	https://www.bbc.com/bitesize/guides/z2yg87h/revision/1 (2 sections)
1 week	Factorising an algebraic expression	<ul style="list-style-type: none"> ◆ Common factor ◆ Difference of squares $p^2x^2 - a^2$ ➤ Common factor with difference of squares ◆ Trinomials with unitary x^2 coefficient ➤ Trinomials with non-unitary x^2 coefficient 	https://www.bbc.com/bitesize/guides/zmvr2p/revision/1 (4 sections) Video: https://www.bbc.com/bitesize/clips/z84nvcw
½ week	Completing the square in a quadratic expression with unitary x^2 coefficient	<ul style="list-style-type: none"> ◆ Convert $y = x^2 + bx + c$ to $y = (x + p)^2 + q$ 	https://www.bbc.com/bitesize/guides/zxcjrw/revision/1 (2 sections)
Applying algebraic skills to algebraic fractions			
1 week	Reducing an algebraic fraction to its simplest form	<ul style="list-style-type: none"> ◆ a / b where a,b are of the form $(x + p)^n$ or $(x + p)(x + q)$ 	https://www.bbc.com/bitesize/guides/zvw9y4j/revision/1 (2 sections)
	Applying one of the four operations to algebraic fractions	<ul style="list-style-type: none"> ◆ $a / b * c / d$ where a, b, c, d can be simple constants or variables. *can be add, subtract, multiply or divide 	https://www.bbc.com/bitesize/guides/zgtv6yc/revision/1 (3 sections)
Applying geometric skills linked to the use of formulae			

Timing	Topic	Content	Resources
½ week	Determining the gradient of a straight line, given two points	◆ $m = \frac{y_2 - y_1}{x_2 - x_1}$	https://www.bbc.com/bitesize/guides/z8383k7/revision/1 (3 sections)
1½ week	Calculating the length of arc or the area of a sector of a circle		https://www.bbc.com/bitesize/guides/zwcqj6/revision/1 (4 sections)
	Calculating the volume of a standard solid	◆ sphere, cone, pyramid	https://www.bbc.com/bitesize/guides/z9bdb82/revision/1 (7 sections)
½ week	(Rounding to a given number of significant figures)		https://www.bbc.com/bitesize/guides/zpc82hv/revision/1 (2 sections)

N5 Mathematics Course outline

December - January

Timing	Topic	Content	Resources
Applying trigonometric skills to triangles which do not have a right angle			
2 weeks	Calculating the area of a triangle using trigonometry	<ul style="list-style-type: none"> ◆ Area = $\frac{1}{2} ab \sin C$ 	https://www.bbc.com/bitesize/guides/zytbh39/revision/1 (2 sections)
	Using the sine and cosine rules to find a side or angle	<ul style="list-style-type: none"> ◆ Sine rule for side or angle ◆ Cosine rule for side ➤ Cosine rule for angle 	https://www.bbc.com/bitesize/guides/z84297h/revision/1 (3 sections)
	Using bearings with trigonometry	<ul style="list-style-type: none"> ◆ To find a distance or direction 	https://www.bbc.com/bitesize/guides/zqwhjty/revision/1 (2 sections)
Applying numerical skills to fractions and percentages			
1 ½ weeks	Working with percentages	<ul style="list-style-type: none"> ◆ Use reverse percentages to calculate an original quantity ◆ Appreciation including compound interest ◆ Depreciation 	https://www.bbc.com/bitesize/guides/z8tv6yc/revision/1 (2 sections) https://www.bbc.com/bitesize/guides/z37pqhv/revision/1 (3 sections)
	Working with fractions	<ul style="list-style-type: none"> ◆ Operations and combinations of operations on fractions including mixed numbers (Addition, subtraction, multiplication, division) 	https://www.bbc.com/bitesize/guides/z2b83k7/revision/1 (3 sections) Videos: https://www.bbc.com/bitesize/clips/zrgtsbk https://www.bbc.com/bitesize/clips/z4cpyrd
Applying geometric skills to vectors			
2 weeks	Working with 2D vectors	<ul style="list-style-type: none"> ◆ Adding or subtracting two-dimensional vectors using directed line segments 	https://www.bbc.com/bitesize/guides/z3rqc6/revision/1 (2 sections)
	Working with 3D coordinates	<ul style="list-style-type: none"> ◆ Determining coordinates of a point from a diagram representing a 3D object 	https://www.bbc.com/bitesize/guides/zgkx8mn/revision/1 (2 sections)
	Using vector components	<ul style="list-style-type: none"> ◆ Adding or subtracting two- or three-dimensional vectors using components ◆ Magnitude of a two or three dimensional vector 	https://www.bbc.com/bitesize/guides/zwncsrd/revision/1 (3 sections) https://www.bbc.com/bitesize/guides/zqykv9q/revision/1 (2 sections)
Applying statistical skills to analysing data			
1 ½ weeks	Comparing data sets using statistics	Compare data sets using	https://www.bbc.com/bitesize/guides/z94297h/revision/1

Timing	Topic	Content	Resources
		calculated/determined: ♦ interquartile range ♦ standard deviation	(5 sections)** Video: https://www.bbc.com/bitesize/clips/zfnjmp3
	Forming a linear model from a given set of data	♦ Determine the equation of a best-fitting straight line on a scattergraph and use it to estimate y given x	https://www.bbc.com/bitesize/guides/zq7s2nb/revision/1 (2 sections)

** Please note in section 4 the article says there are TWO formulae for Standard Deviation then lists one. In St Thomas we use the other formula which is

$$SD = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n - 1}}$$

This gets the same correct answer as the other formula but there are fewer places to drop careless marks.

N5 Mathematics Course outline

February – April

Timing	Topic	Content	Resources
Applying algebraic skills to linear equations			
2 weeks	Determining the equation of a straight line, given the gradient	<ul style="list-style-type: none"> ◆ Use the formula $y - b = m(x - a)$ or equivalent to find the equation of a straight line, given one point and the gradient of the line ◆ Use functional notation $f(x)$ ◆ Identify gradient and y-intercept from $y = mx + c$ ➤ Identify gradient and y-intercept from various forms of the equation of a straight line 	https://www.bbc.com/bitesize/guides/z24qci6/revision/1 (3 sections)
	Working with linear equations and inequations	<ul style="list-style-type: none"> ◆ Coefficients are a member of Z ◆ Solutions are a member of Q 	https://www.bbc.com/bitesize/guides/zwgdb82/revision/1 (3 sections) Video: https://www.bbc.com/bitesize/clips/z7w3cdm
2 weeks	Working with simultaneous equations	<ul style="list-style-type: none"> ◆ Construct from text ◆ Graphical solution ◆ Algebraic solution 	https://www.bbc.com/bitesize/guides/z8gdb82/revision/1 (4 sections) Video: https://www.bbc.com/bitesize/clips/zmqg9j6
	Changing the subject of a formula	<ul style="list-style-type: none"> ◆ Linear equation ➤ Equation involving a simple square or square root 	https://www.bbc.com/bitesize/guides/zx2n7p3/revision/1 (3 sections)
Applying algebraic skills to quadratic equations			
2 weeks	Working with quadratic equations	<ul style="list-style-type: none"> ◆ Solving from factorised form ◆ Graphical treatment ◆ Solving using the quadratic formula ◆ Know and use the discriminant ◆ Determine the number or nature of roots 	https://www.bbc.com/bitesize/guides/zwmyxfr/revision/1 (2 sections) https://www.bbc.com/bitesize/guides/zctbh39/revision/1 (3 sections) https://www.bbc.com/bitesize/guides/zcwhjty/revision/1 (3 sections)
Applying geometric skills to lengths, angles and similarity			
1 week	Applying the Pythagoras' theorem	<ul style="list-style-type: none"> ◆ Using Pythagoras' theorem in complex 	https://www.bbc.com/bitesize/guides/zq8x8mn/revision/1 (6 sections)

Timing	Topic	Content	Resources
		situations including converse and 3D	
1 week	Applying the properties of shapes to determine an angle involving at least two steps	<ul style="list-style-type: none"> ◆ Quadrilaterals/triangles/polygons/circles ➤ Relationship in a circle between the centre, chord and perpendicular bisector 	https://www.bbc.com/bitesize/guides/z3y9y4j/revision/1 (8 sections)
1 week	Using similarity	<ul style="list-style-type: none"> ◆ Interrelationship of scale — length, area and volume 	https://www.bbc.com/bitesize/guides/zxmfmsg/revision/1 (3 sections)
Applying algebraic skills to graphs of quadratic relationships			
1 week	Recognise and determine the equation of a quadratic function from its graph	<ul style="list-style-type: none"> ◆ Equations of the form $y = kx^2$ and $y = (x + p)^2 + q$; $k, p, q \in \mathbb{Z}$ <li style="color: red;">Also $y = k(x + p)^2 + q, k \in \mathbb{Z}$ 	https://www.bbc.com/bitesize/guides/zxqpqhv/revision/1 (2 sections)
1 week	Sketching a quadratic function	<ul style="list-style-type: none"> ◆ Equations of the form $y = (x - m)(x - n)$ ◆ Also $y = k(x + p)^2 + q, k \in \mathbb{Z}$ 	https://www.bbc.com/bitesize/guides/zq2fmsg/revision/1 (3 sections)
1 week	Identifying features of a quadratic function	<ul style="list-style-type: none"> ◆ Identify nature, coordinates of turning point and the equation of the axis of symmetry of a quadratic of the form ◆ $y = (x + p)^2 + q$ where $k = 1$ or -1 	https://www.bbc.com/bitesize/guides/zqxx6yc/revision/1 (3 sections)
Applying trigonometric skills to graphs and identities			
1 week	Working with the graphs of trigonometric functions	<ul style="list-style-type: none"> ◆ Basic graphs ◆ Amplitude ◆ Vertical translation ◆ Multiple angle ➤ Phase angle 	https://www.bbc.com/bitesize/guides/zwbwgdM/revision/1 (4 sections)
1 week	Working with trigonometric relationships in degrees	<ul style="list-style-type: none"> ◆ Sine, cosine and tangent of angles $0^\circ - 360^\circ$ ◆ Period ◆ Related angles ◆ Solve basic equations 	https://www.bbc.com/bitesize/guides/zyxv6yc/revision/1 (2 sections)

Timing	Topic	Content	Resources
		➤ Identities $\cos^2 x + \sin^2 x = 1$ $\tan x = \frac{\sin x}{\cos x}$	