



The James Young High School

Snr Phase Information Evening

Barry Whelan

Presentation Outline



Course Structure and Pathways at Snr phase



Overview of Content of each course



Digital Learning Resources / Extra Support

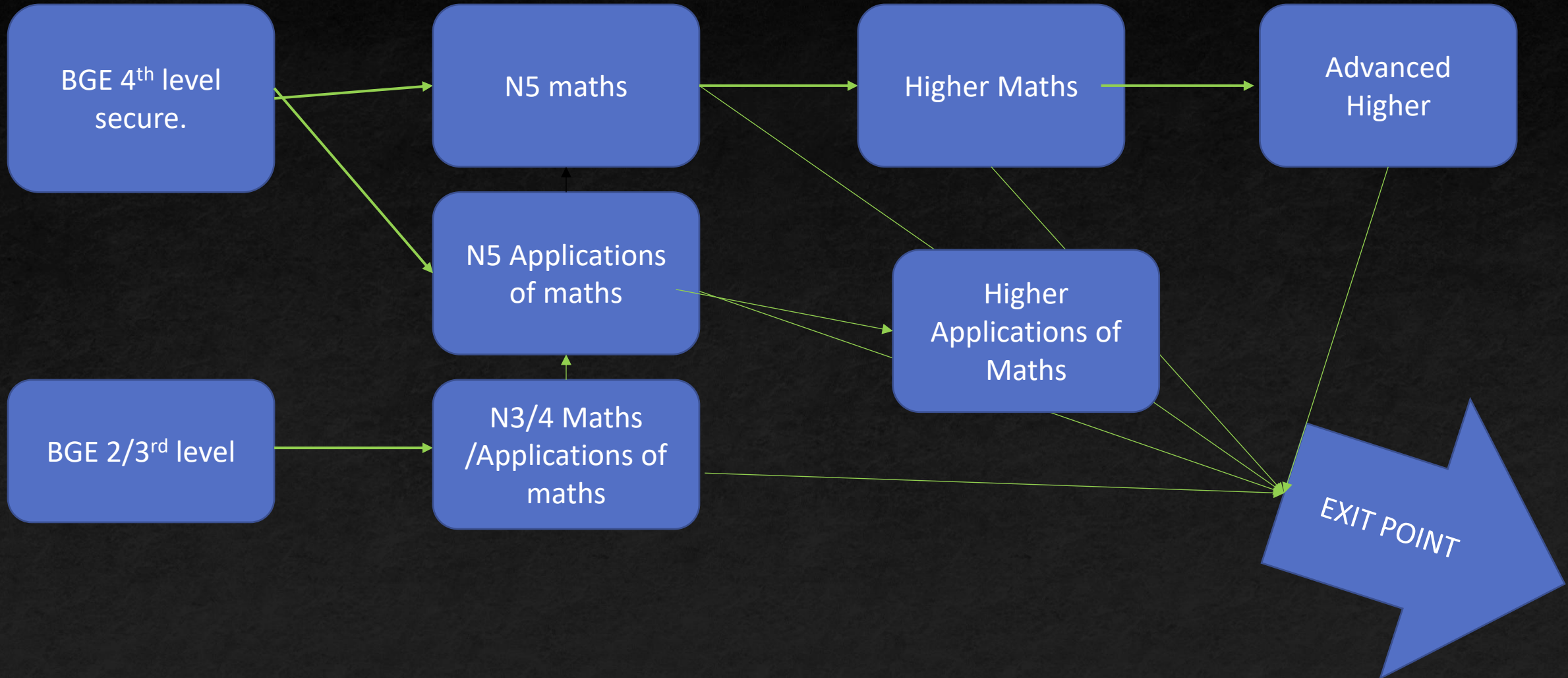


Attitude and Homework Expectations



Supporting at Home

The maths journey



BGE

- In The BGE we study both Pure Maths and Applications.
- University Courses Now Accept both Highers as separate qualifications

Edinburgh Medicine

The Higher grades you need to be considered for an offer

These are the grades most applicants needed to receive an offer in recent years:

- AAAAB by end of S5 and BB at Advanced Higher in S6

[What do these grades mean?](#)

Resits

All examination grades must be obtained at the first attempt of each subject.

If you are applying with resit qualifications, you will not be entered into the selection system except in very exceptional circumstances, for which you must have provided verified evidence prior to UCAS application.

Required subjects

The grades you use to meet our entry requirements must include the following at Higher:

- Chemistry
- two from Biology/Human Biology, Mathematics/Applications of Mathematics or Physics

National 4 Maths and Apps

National 4 courses are internally assessed.

3 units plus Added Value

Students get once test and one resit for each unit. A pass is obtained if pass is gained in each of 3 units plus the added value.

Students in these classes also aim to obtain N5 Numeracy as an extension and preparation for N5 Apps.

Patterns and Sequences

Knowledge	Example Questions	Resource										
Finding the formula from a sequence of numbers	1. Find the formula for the following sequence of numbers: 5, 8, 11, 14, ... The formula is $an \pm b$. When n is 1, $a(1) \pm b = 5$, when n is 2, $a(2) \pm b = 8$, etc. We find a by looking at the change from each number to the next. The numbers go up by 3 each time which means the formula involves multiplication by 3. So, the formula is $3n \pm b$. Next, we find b. When n is 1, $3(1) \pm b = 5$ so $3 \pm b = 5$, therefore $b = 2$. The formula is $3n + 2$	Patterns and Sequences										
Using a formula to calculate the terms in a sequence	2. (a) Find the formula for the following sequence of numbers: 5, 12, 19, 26, ... The numbers go up by 7 which means the sequence involves multiplication by 7. So $7n \pm b$. When n is 1, $7(1) \pm b = 5$ so $7 \pm b = 5$, therefore $b = -2$. The formula is $7n - 2$ (b) Use the formula to find the 13th term in the sequence. To find the 13th term, substitute 13 for n in the formula. When n is 13, $7(13) - 2 = 91 - 2 = 89$ So, the 13th term is 89.	Patterns and Sequences										
Finding a formula connecting two related terms	3. The table below shows two related variables. (a) Find the formula relating the two variables. <table border="1"><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>5</td><td>10</td><td>15</td><td>20</td></tr></table> In the linear relationship $y = ax + b$, we find a by looking at the difference in each of the numbers. The numbers go up by 5 each time, which means the sequence involves multiplication by 5. So $y = 5x \pm b$. When $x = 1$, $y = 5$, so $b = 0$. ∴ The formula is $y = 5x$. (b) Given $y = 55$, use the formula to calculate x. Substitute $y = 55$ into the formula and solve for x. $55 = 5x$ $x = 11$	x	1	2	3	4	y	5	10	15	20	Patterns and Sequences
x	1	2	3	4								
y	5	10	15	20								

Finding the median	1. Find the median of the set of data: 10 7 6 7 9 3 7 Step 1: Put the data in order from the lowest to the highest number: 3 6 7 7 7 9 10 Step 2: identify the middle number: 3 6 7 <u>7</u> 7 9 10 median = 7	Stats
Finding the mode	Worked Example: Find the mode of: 10 7 6 7 9 3 7 Step 1: Put the data in order from the lowest to the highest number. 3 6 7 7 7 9 10 Step 2: Identify the most commonly occurring number: mode = 7	Stats
Calculating the range	Worked Example: Find the range of: 10 7 6 7 9 3 7 Step 1: It may be useful to put the data in order, particularly if there is a large number of values: 3 6 7 7 7 9 10 Step 2: Calculate the range: range = $10 - 3 = 7$	Stats
Comparing Data	Jemima is training for a half-marathon. She runs 8 miles every second day over a two-week period. Her times in minutes are as follows: 61, 65, 61, 63, 59, 61, 57. (a) Calculate the mean and the range of her running times. mean = $\frac{61 + 65 + 61 + 63 + 59 + 61 + 57}{7} = \frac{427}{7} = 61$ minutes range = $65 - 57 = 8$ minutes (b) Over the next two weeks she follows the same training programme. This time her mean running time is 58 minutes and the range is 6 minutes. Compare her training in the first two weeks and second two weeks. Compare the averages: In the second two weeks, on average her running times were lower. Compare the range: In the second two weeks, her running times were less varied / more consistent.	Stats

Download the Complete Scheme of Work from this link : [Level 4/Nat 4 to N5 Pathway](#)

National 5 Maths and Apps

National 5 course award is completely decided on Final Exam Award

No internal assessment contributes to the grade

Grades A to D

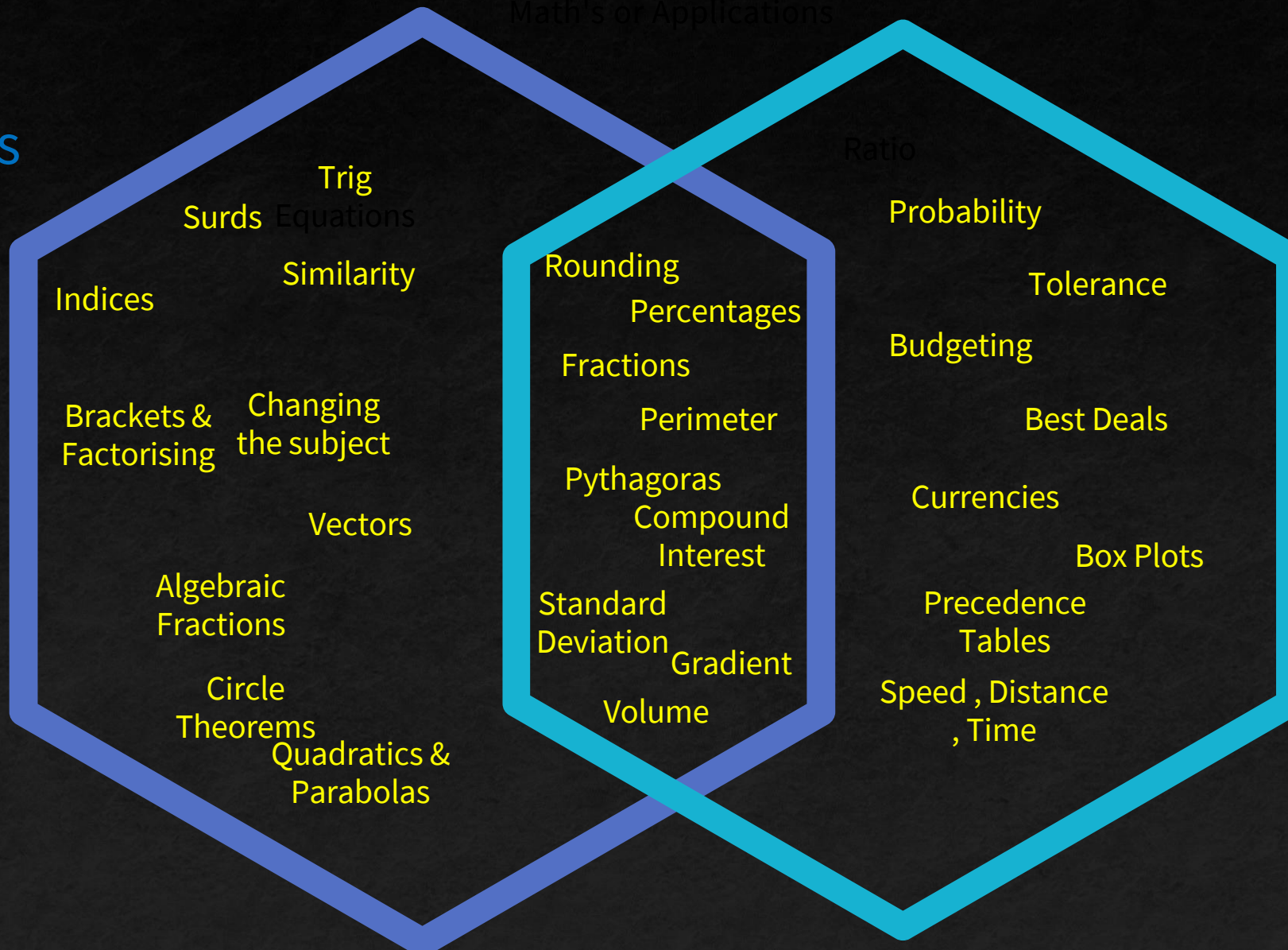
Major Assessment in October (Exam Standard , P1 and P2).

Prelim in December (P1 and P2)

March (Final Exam Content)

Topics in N5 Math's and Applications

Nat 5 Math's



Nat 5 Apps.

Trigonometric Functions

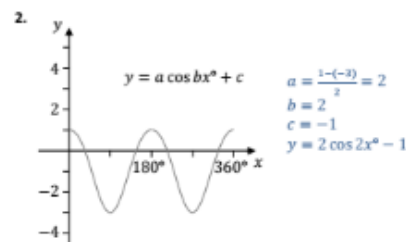
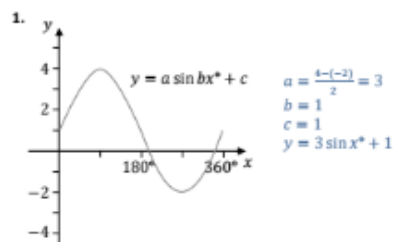
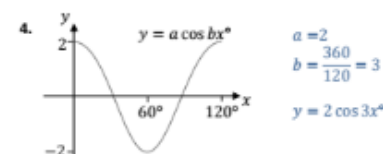
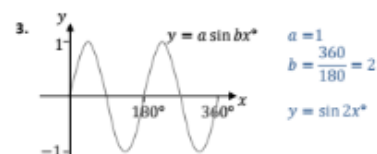
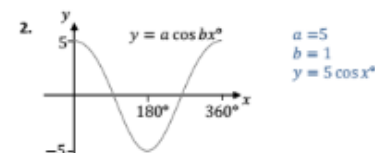
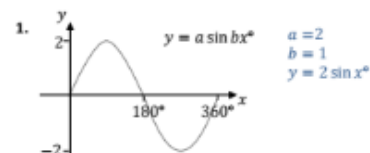
Knowledge

Example Questions

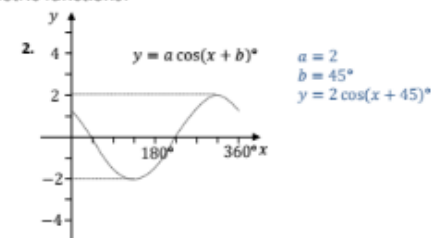
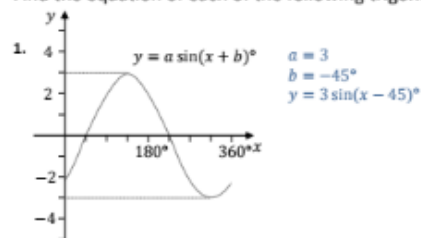
Resource

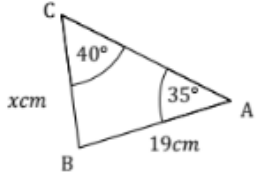
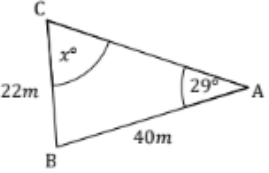
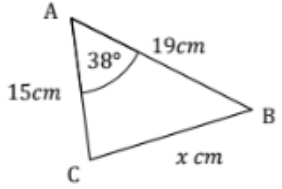
Finding The Equation of a trig function

[Trigonometric Functions](#)



Find the equation of each of the following trigonometric functions:



Sine Rule Side	Calculate the value of x.  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ $\frac{a}{\sin A} = \frac{c}{\sin C}$ $\frac{x}{\sin 35} = \frac{19}{\sin 40}$ $x = \frac{19 \sin 35}{\sin 40}$ $x = 17.0\text{cm (1 d.p.)}$	Triangle Trigonometry
Sine Rule Angle	Calculate size of angle x.  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ $\frac{a}{\sin A} = \frac{c}{\sin C}$ $\frac{22}{\sin 29} = \frac{40}{\sin x}$ $22 \sin x = 40 \sin 29$ $\sin x = \frac{40 \sin 29}{22}$ $x = \sin^{-1}\left(\frac{40 \sin 29}{22}\right)$ $x = 61.8^\circ \text{ (1 d.p.)}$	Triangle Trigonometry
Cosine Side	Calculate the length of side x.  $a^2 = b^2 + c^2 - 2bc \cos A$ $x^2 = 15^2 + 19^2 - 2 \times 15 \times 19 \cos 38$ $x = \sqrt{15^2 + 19^2 - 2 \times 15 \times 19 \cos 38}$ $x = 11.7\text{cm (1 d.p.)}$	Triangle Trigonometry

Download the Complete Scheme of Work from this link : [Level 4/Nat 4 to N5 Pathway](#)

Higher Maths

Higher Maths course award is completely decided on Final Exam Award

No internal assessment contributes to the grade

Grades A to D

Major Assessment in October (Exam Standard , P1 and P2).

Prelim in December(P1 and P2)

March (Final Exam Content)

<u>JUNE</u>	<u>4 weeks = 24 periods</u>
U0 INTRO SKILLS (5)	
U1-1 EQN LINE (7 + 3) - leave intersections to August	
U1-2 FUNCTIONS (14 + 7) - i.e cont. in August	
<u>AUGUST - OCTOBER</u>	<u>9 weeks = 54 periods</u>
U1-3 DIFFERENTIATION (18)	
U1-4 RECURRENCE RELATIONS (8)	
Unit Test - Task 'A' (4) + Extended Test (old Unit 1)	
U2-1 POLYNOMIALS/QUADRATIC THEORY (14)	
<u>OCTOBER - DECEMBER</u>	<u>8 weeks = 48 periods</u>
U2-2 INTEGRATION (12) [incl Area Under a Curve]	
U2-3 TRIGONOMETRY (16) [incl Wave Function]	
U2-4 CIRCLE (10)	
Unit Test - Task 'B' (4)	
Catch Up Time/Prelim Revision (6)	
<u>JANUARY - MARCH</u>	<u>12 weeks = 72 periods</u>
Prelim Exam [All Unit 1 & 2 topics including stated amendments]	
U3-1 VECTORS (12)	
U3-2 CALCULUS APPLICATIONS (10)	
U3-3 LOG EXP (8)	
Unit Test - Task 'C' (4)	
Final Revision	

Link to Higher Scheme of work – [Higher](#)

Higher Apps

Question paper

65 marks

The question paper allows candidates to demonstrate the application of mathematical skills, knowledge and understanding from across the course.

The question paper gives candidates an opportunity to apply an understanding of the underlying processes involved in mathematical modelling, statistics, finance, planning and decision making, numerical skills, and reasoning skills as specified in the 'Skills, knowledge and understanding for the course assessment' section.

The question paper has 65 marks, scaled up to 80 marks after marking, out of a total of 110 marks for the course assessment.

Project

30 marks

The project gives candidates an opportunity to demonstrate the following statistical skills, knowledge and understanding:

- ♦ applying statistical skills to data
- ♦ analysing data, interpreting and communicating findings using statistical skills

The project has 30 marks out of a total of 110 marks for the course assessment.

Candidates research and report on a topic that allows them to apply statistical skills and knowledge in Applications of Mathematics at a level appropriate to Higher.

- **Regular Progress Assessments:** We will conduct regular progress checks, typically consisting of assessments worth approximately 20 marks, to gauge understanding and track development.
- **Preliminary Examination (January):** A preliminary examination will take place in January. This will serve as a trial run for the final exam, though it will not be of full length.
- **Software Utilisation (R Studio):** We will be utilizing R Studio, a free and widely accessible software package. It is available for download and includes a variety of tutorials to help with learning and application.

Higher Apps

Applying statistical skills to correlation and linear regression	♦ interpreting and constructing scatter plots ♦ using simple linear regression ♦ interpreting the slope and intercept parameters in relation to data ♦ using linear models for prediction ♦ assessing the accuracy of predictions ♦ understanding and interpreting correlations ♦ understanding the applicability of Pearson's product-moment correlation coefficient ♦ exploring trends in data, for example seasonality
Applying statistical skills to data analysis, interpretation and communication	♦ formulating research questions ♦ interpreting and reporting the results of a hypothesis test ♦ generating, understanding, and interpreting confidence intervals ♦ performing simple analysis using t-tests and paired t-tests

Units Covered: The course will include key units such as Statistics, Modelling, Planning, Decision-Making, and Finance.

Adv Maths

Adv Maths course award is completely decided on Final Exam Award

No internal assessment contributes to the grade

Grades A to D

Major Assessment in October (Exam Standard , P1 and P2).

Prelim in December(P1 and P2)

March (Final Exam Content)

Encourage higher students to take this in s6, very strong record at school

Sequences (Applications 1.2)			
Arithmetic Series		1	
Geometric Series		1	
Sums to Infinity		1	
Expanding function using sum to infinity		1	
Summation of other series		1	
Special Summations		1	
Review		1	
test		1	Q3,Q4 ,Q6(Apps)
Past Papers review previous 3 topics		1	Homework Complex Numbers
Number Theory and Proof (Geometry 1.4 and 1.5)			
Division algorithm and GCD		1	
Euclidean Algorithm		2	
Diophantine Equations		1	
Number bases		1	
Introducing Proof		1	
Direct Proof /Proof by induction		2	
Summation formula		1	
Proof by contrapositive		1	
Proof by contradiction		2	
review		1	
test		1	
Past Papers review previous 3 topics		1	Homework sequences

Link to Adv Scheme of work – [Adv H](#)

 [National 4 - Scheme of Distance Learning](#). [319.94KB]

 [Nat 5 Scheme of Distance Learning](#). [222.22KB]

(Exercises assigned in the Nat 5 Scheme of Distance Learning use references to the following booklets)

- **Nat 5 Reference Booklets**
-  [Maths Expression \(MExp1\)](#). [1.04MB]
-  [Maths Applications Part 1 \(MApPs1\)](#). [2.97MB]
-  [Maths Applications Part 2 \(MApPs2\)](#). [722.8KB]
-  [Maths Relationships Part 1 \(MRel1\)](#). [7.75MB]
-  [Maths Relationships Part 2 \(MRel2\)](#). [872.24KB]

 [Higher Maths - Scheme of Distance Learning](#). [116.75KB]

 [Advanced Higher Distance Learning](#). [133.32KB]

Link to website to download distance learning materials – [Website Link](#)

One Drive Links

[National 5](#)

[Higher](#)

[Adv Higher](#)

Zeta Maths Subscription

[Log in - Zeta Maths](#)

Password : Jysch

After School Support

- All Levels — Nearly Wednesday and Thursday after school with Mr. Whelan.
- Targeted Supported Study for individual course – Will come near the end of October
- Higher Applications – Tuesday after school

Attitude and Expectations

Fostering a Positive Attitude Towards Mathematics : Encourage students to develop a positive mindset towards mathematics. They should be motivated to become proactive agents of change by taking personal responsibility for their learning. Students are encouraged to make full use of extra classes and available online resources.

Calculator Requirement : All students are required to have a calculator for their coursework and assessments.

Homework Expectations: Will take a variety of forms , preparation for regular quizzes , assessments . Mixed Review exercises and finish off some general consolidation. Homework and assessments should be communicated through Satchel One.

Caution Regarding Phone Use and Social Media: Students should be mindful of the potential distractions posed by phone use and social media, particularly in the lead-up to assessments.

The Importance of High Attendance: High attendance is crucial for academic success. A research study conducted in England identified attendance above 95% as the primary factor for achieving five strong GCSE passes.

Lesson Evaluation Toolkit :typical features of high-quality lessons

<i>Elements</i>	<i>Illustrations</i>	<i>Notes</i>
<i>Smooth Start</i>	• <i>Students come into lessons and settle within the first 5 minutes.</i> • <i>Students have a set routine to begin the lesson</i> • <i>Students know how to collect all resources for the lesson</i>	
<i>Shared Goal</i>	• <i>The goal of the lesson is shared with the students.</i> • <i>The goal is highlighted throughout the lesson.</i> • <i>Links to applications, the curriculum as appropriate</i> • <i>The students can articulate when asked what the goal of lesson was.</i>	
<i>Teaching for long term retention</i>	• <i>Previous learning is reviewed.</i> • <i>Quizzes are used to check for understanding</i> • <i>Linking of current content to previous content, interleaving/ interweaving.</i>	

<i>Modelling the learning</i>	• <i>Clear verbal and visual presentation of the material.</i> • <i>Analogies and concrete representation used where appropriate</i> • <i>Prerequisites are checked before beginning new content.</i> • <i>Presentation is interactive with frequent checks for understanding.</i>	
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	• <i>All students participating in questioning, whole class response, cold call, show me boards.</i> • <i>Wait time given for high order questions / think pair shares used.</i> • <i>Students obtain a high success rate before independent practice.</i>	
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Independent Practice	• <i>Students get chance to practice material independently</i> • <i>Students have access to answers to check progress</i> • <i>Teacher observes throughout the room, giving feedback as necessary</i> • <i>All students obtain success and appropriate challenge</i>	
Relationships	• <i>Teacher knows the students well</i> • <i>Students are praised for effort</i> • <i>High expectations of behaviour and quality of work</i> • <i>Time and resources are used effectively</i> • <i>Poor student behaviour is dealt with in a systematic and calm manner</i>	

Lesson Exit

- *Lesson is ended in calm and orderly fashion*
- *Students have a chance to reflect on their learning*
- *Exit tickets are used to check for understanding*

Enhancing Maths Learning with Thinking Classrooms

This year, the **Maths Department** is using **Building Thinking Classrooms (BTC)** strategies as part of a broader approach to improving student engagement and problem-solving skills.

◆ What Does This Involve?

- Students working in **random groups**
- Learning while **on their feet**, using **vertical surfaces**
- Tackling **non-routine problems** to encourage deeper thinking

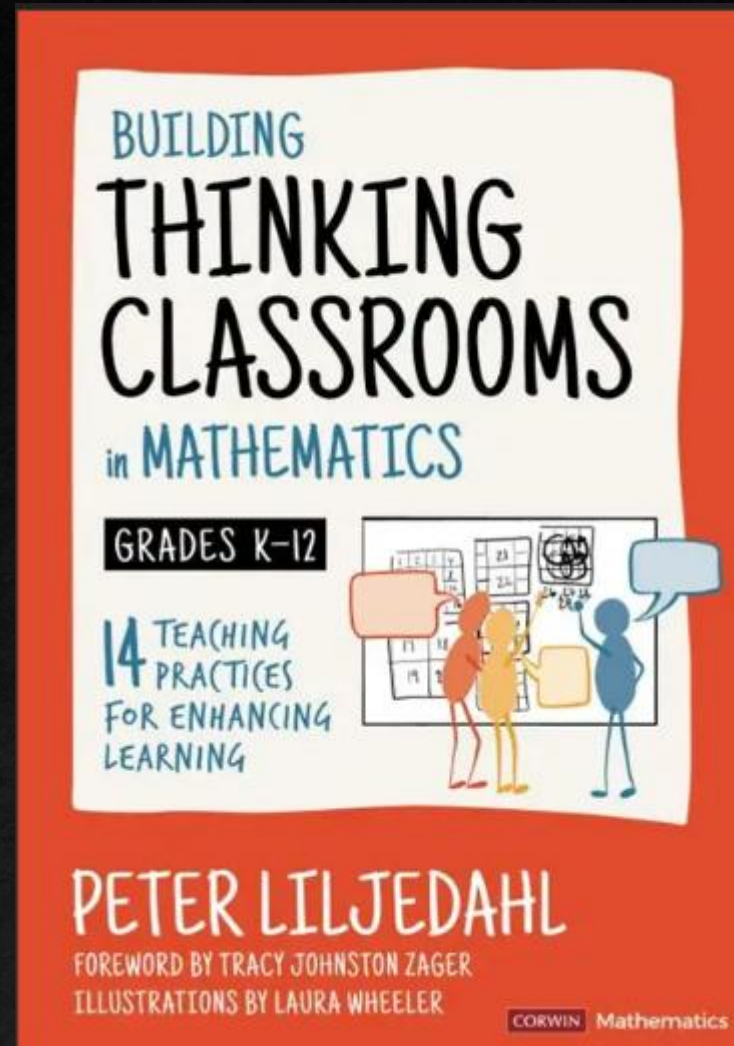
Why Are We Using This Approach?

BTC is one of many strategies we are exploring to **support students in developing mathematical understanding beyond basic fluency**. It aligns with our learning pathway:

✓ **Acquisition → Fluency → Accuracy → Retention → Generalisation → Adaptation**

While BTC is not a revolutionary change, it is a valuable tool that helps students **collaborate, explore concepts more deeply, and build problem-solving resilience**. It also strengthens social connections in class and supports **higher-order thinking skills**.

We look forward to seeing how this strategy benefits students alongside other effective teaching approaches  



What can you do support

Make regular practice part of the everyday routine. Fifteen minutes per day per subject always has more impact than last-minute revision, both in terms of understanding and retention

Use Satchel One to keep track of homework and assessment tasks.

Communicate about learning and encourage a problem-solving approach

Contact me directly if you have any questions or concerns about maths or physics and we can get to the bottom of it. This will be much more efficient than contacting the main school office or even the house head.

Questions Please

Contact me anytime at :
wlbarry.Whelan@glow.sch.uk