



Maths

Key Stage 4 Framework for Learning

Year 11 2016-2017: I am Creative, Successful, Happy

Syllabus:

GCSE Edexcel (9-1) Mathematics

Autumn 1

<p>Knowledge</p>	<ul style="list-style-type: none"> • Number and Calculator skills (find the reciprocal of simple numbers/fractions mentally) • Measures • Accuracy and Bounds • Factors, Multiples and Primes (use prime factorisation to represent a number as a product of its primes using index notation) • Perimeter and Area (use and apply Pythagoras' theorem to solve problems) • Indices and Surds (recall that $n^0 = 1$ and $n^{-1} = 1/n$ for positive integers n as well as $n^{1/2} = \sqrt{n}$ and $n^{1/3} = \sqrt[3]{n}$ for any positive number n; simplify surd expressions involving squares (e.g. $\sqrt{12} = \sqrt{4 \times 3} = 2\sqrt{3}$); simplify surd expressions involving squares) • Geometry of 2D and 3D Shapes • Angles • Trigonometry (find angles of elevation and angles of depression; know and apply the sine rule $a/\sin A = b/\sin B = c/\sin C$ to find unknown lengths and angles; know and apply the cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$ to find unknown lengths) • Fractions • Symbols
<p>Skills</p>	<ul style="list-style-type: none"> • 4 Operations • Solving multistep worded problems • Use of mathematical equipment • Reading scales • Rounding • Recognising parts of a whole • Substitution • Ability to answer QWC Questions
<p>Assessment</p>	<p>Students will complete a mock GCSE examination paper for the new specification 9-1 GCSE during Week 3 of the term. Students will be provided with feedback on their examination in the form of a Personal Learning Checklist and two stars and a wish.</p> <p>Students will be assessed on their written piece of homework which assess their skills in answering a Quality of Written Communication exam question.</p> <p>Students will be assessed on their understanding of a specific topic chosen by their teacher from the topics listed above. Feedback for this will be provided in the form of two stars and a wish.</p>
<p>Reward & enrichment</p>	<p>Parents can encourage students to research cultural Mathematics using a number of websites:</p> <p>Mathematical Games from Around the World: https://nrich.maths.org/8261</p> <p>Parents can encourage students to download inspiring TED Talks about the magic behind square numbers: https://www.ted.com/playlists/189/math_talks_to_blow_your_mind</p>
<p>Character</p>	<p>Reflection – students are encouraged to reflect on every practice exam performance through the use of an exam PLC.</p>

Autumn 2

<p>Knowledge</p>	<ul style="list-style-type: none"> • Percentages • Data Types and Sampling • FDP • Sequences • Equations, Iteration (Quadratic Sequences, Quadratics and Polynomials) (rearrange simple equations; use systematic trial and improvement to find the approximate solution to one decimal place of equations such as $x^3 = 29$) • Simultaneous Equations • Proportion and Rates of Change (express a multiplicative relationship between two quantities as a ratio or a fraction; use compound interest)
-------------------------	--



Skills	<ul style="list-style-type: none"> • Multiplication • Division • Interpreting data • Pattern recognition • Understanding how ratio/proportion link together • Ability to answer QWC Questions
Assessment	<p>Students will complete their College Entry examinations which will inform further set movements in Spring 1 and determine tier of entry.</p> <p>Students will be assessed on their written piece of homework which assess their skills in answering a Quality of Written Communication exam question.</p> <p>Students will be assessed on their understanding of a specific topic chosen by their teacher from the topics listed above. Feedback for this will be provided in the form of two stars and a wish.</p>
Reward & enrichment	<p>A selection of students may have the opportunity to attend a revision day at Manchester University to gain exam key skills.</p> <p>Parents can encourage students to download inspiring TED Talks about the why unknown in Algebra is “x”. https://www.ted.com/playlists/189/math_talks_to_blow_your_mind</p>
Character	<p>Motivation – students are provided key motivational messages throughout their Year 11 Maths experience in order for them to gain confidence.</p> <p>Resiliency – students are encouraged to tackle a multitude of A03 style questions in which they have to solve multi-step problems which require resiliency.</p>

Spring 1

Knowledge	<ul style="list-style-type: none"> • Surface Area and Volume • Collecting and Displaying Data • Co-ordinates • Transformations (recognise whether a reflection is correct) • Ratio (express a multiplicative relationship between two quantities as a ratio or a fraction) • Probability (use tree diagrams to calculate the probability of two dependent events; use tree diagrams to calculate the probability of two independent events) • Constructions (draw the locus equidistant between 2 points or from a point; produce shapes and paths by using descriptions of loci) • Linear Graphs (know that the gradient of a line is the change in y over change in x; know that a line perpendicular to the line $y = mx + c$, will have a gradient of $-1/m$) • Statistical Measures • Similarity, Congruence and Scale (know that enlargements of 2D shapes produce similar shapes; understand that the ratio of any two sides is constant in similar right-angled triangles)
Skills	<ul style="list-style-type: none"> • Drawing and labelling axes • Comparing and interpreting averages and range • Identifying parallel and perpendicular lines • Ability to answer QWC Questions
Assessment	Students will complete GCSE exams papers every two weeks/weekly dependent on ability. Written feedback will be given on this in the form of a PLC and students will be able to focus their revision efforts on areas of weakness.
Reward & enrichment	A selection of students will be invited to a PiXL Maths conference which will be focused on the key knowledge and understanding required to achieve a Level 5 on either a Foundation or a Higher paper.
Character	<p>Creativity – students are encouraged to try various pathways to tackle a problem as often there can be numerous ways to reach a solution, for example when tackling Circle Theorems.</p> <p>Empathy – student-friendly mark schemes are provided and used by peers to assess work and give constructive feedback.</p>

Spring 2

Knowledge	Revision based topics tailored to students’ specific learning needs as identified through use of PLCs and practice examinations.
Skills	
Assessment	Students will complete GCSE exams papers every two weeks/weekly dependent on ability. Written feedback will be given on this in the form of a PLC and students will be able to focus their revision efforts on areas of weakness.
Reward & enrichment	Parents can encourage students to download inspiring TED Talks on Maths and Physics posing questions such as “What if you hit a baseball moving at the speed of light?” https://www.ted.com/playlists/189/math_talks_to_blow_your_mind
Character	Responsibility – students are provided with a choice of over 100 revision topics at afterschool sessions and it is their responsibility to choose an area of weakness to focus on.



Curiosity – students are encouraged to learn independently through PiXL Maths app and Mathswatch.

Summer 1

Knowledge	Revision based topics tailored to students' specific learning needs as identified through use of PLCs and practice examinations.
Skills	
Assessment	Students will complete GCSE exams papers every two weeks/weekly dependent on ability. Written feedback will be given on this in the form of a PLC and students will be able to focus their revision efforts on areas of weakness.
Reward & enrichment	
Character	Optimism – students continuously track their own progress throughout the year and reflect on their learning journey. This for many can provide optimism and motivation.