Year 10 Maths Higher Curriculum Plan

	Key questions	Overview of the module	Assessment	Cross Curricular Skills	Suggested reading material and websites:
Module 1 **Sequences**	• A sequence has the first two terms 1, 2, … Show me a way to continue this sequence. And another. And another … • A sequence has nth term $3n^2 + 2n – 4$. Jenny writes down the first three terms as 1, 12, 29. Kenny writes down the first three terms as 1, 36, 83. Who do agree with? Why? What mistake has been made? • What is the same and what is different: 1, 1, 2, 3, 5, 8, … and 4, 7, 11, 18, 29, …	• recognise and use Fibonacci type sequences, quadratic sequences	Students will sit a short diagnostic assessment at before the start of each topic to inform teaching. The unit finishes with an End of Unit Test. The department emails results to parents including improvements highlighted in pink. Students complete full corrections on tests to ensure they understand the entire unit before moving on.	**Literacy:** Term Term-to-term rule Position-to-term rule nth term Generate Linear Quadratic First (second) difference Fibonacci number Fibonacci sequence **Thinking Skills:** Students are supported to develop high level problem solving skills, applying challenging mathematical concepts to a range of unforeseen, multi-step problems. They will also be encouraged to infer the meaning of new vocabulary and deduce different methods of working.	www.kerboodle.com www.mymaths.co.uk/ www.khanacademy.org/ https://campus.mangahigh.com www.bbc.co.uk/education/subjects/z38pycw https://nrich.maths.org/

Module 2 Trigonometry	• Show me an angle and its exact sine (cosine / tangent). And another … • Convince me that you have chosen the correct trigonometric function • (When exploring sets of similar triangles and working out ratios in corresponding cases) why do you think that the results are all similar, but not the same? Could we do anything differently to get results that are closer? How could we make a final conclusion for each ratio?	• make links to similarity (including trigonometric ratios) and scale factors • know the exact values of sinθ and cosθ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tanθ for θ = 0°, 30°, 45° and 60° • know the trigonometric ratios, sinθ = opposite/hypotenuse, cosθ = adjacent/hypotenuse, tanθ = opposite/adjacent • apply it to find angles and lengths in right-angled triangles in two dimensional figures	Students will sit a short diagnostic assessment at before the start of each topic to inform teaching. The unit will be followed by an end of unit assessment. These assessments are stored and marked on a system called MiniTest. This allows us to track the progress made throughout the topic. A copy of the end of unit assessment will be emailed to parents and students as well as being recorded in their work book.	**Literacy:** Similar Opposite Adjacent Hypotenuse Trigonometry Function Ratio Sine Cosine Tangent Angle of elevation, angle of depression **Thinking Skills:** Students are supported to develop high level problem solving skills, applying challenging mathematical concepts to a range of unforeseen, multi-step problems. They will also be encouraged to infer the meaning of new vocabulary and deduce different methods of working.	www.kerboodle.com www.mymaths.co.uk/ www.khanacademy.org/ https://campus.mangahigh.com www.bbc.co.uk/education/subjects/z38pycw https://nrich.maths.org/

| Module 3 **Changing The Subject** | Jenny thinks that if $y = 2x + 1$ then $x = (y – 1)/2$. Kenny thinks that if $y = 2x + 1$ then $x = y/2 – 1$. Who do you agree with? Explain your thinking. | • use and interpret algebraic notation, including: a^2b in place of $a \times a \times b$, coefficients written as fractions rather than as decimals
• substitute numerical values into scientific formulae
• rearrange formulae to change the subject | Students will sit a short diagnostic assessment at before the start of each topic to inform teaching.

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Product
Variable
Term
Coefficient
Common factor
Factorise
Power
Indices
Formula, Formulae
Subject
Change the subject
Thinking Skills:
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| Module 4

Graphs | • Convince me the lines y = 3 + 2x, y – 2x = 7, 2x + 6 = y and 8 + y – 2x = 0 are parallel to each other.
• What is the same and what is different: y = x, y = x², y = x³ and y=1/x ?
• Show me a sketch of a quadratic (cubic, reciprocal) graph. And another. And another …
• Sketch a distance/time graph of your journey to school. What is the same and what is different with the graph of a classmate? | • identify and interpret gradients and intercepts of linear functions algebraically
• use the form $y = mx + c$ to identify parallel lines
• find the equation of the line through two given points, or through one point with a given gradient
• interpret the gradient of a straight line graph as a rate of change
• recognise, sketch and interpret graphs of quadratic functions
• recognise, sketch and interpret graphs of simple cubic functions and the reciprocal function y = 1/x with x ≠ 0
• plot and interpret graphs (including reciprocal graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration | Students will sit a short diagnostic assessment at before the start of each topic to inform teaching.

The unit will be followed by an end of unit assessment.

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Function, equation
Linear, non-linear
Quadratic, cubic, reciprocal
Parabola, Asymptote
Gradient, y-intercept, x-intercept, root
Rate of change
Sketch, plot
Kinematic
Speed, distance, time
Acceleration, deceleration

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Module 5 Arcs, Sectors and Surface Area	• Show me a sector with area 25π. And another. And another … • Always/ Sometimes/ Never: The value of the volume of a prism is less than the value of the surface area of a prism. • Always/ Sometimes/ Never: If $a^2 + b^2 = c^2$, a triangle with sides a, b and c is right angled. • Kenny thinks it is possible to use Pythagoras' theorem to find the height of isosceles triangles that are not right- angled. Do you agree with Kenny? Explain your answer. • Convince me the hypotenuse can be represented as a horizontal line.	• identify and apply circle definitions and properties, including: tangent, arc, sector and segment • calculate arc lengths, angles and areas of sectors of circles • *calculate surface area of right prisms (including cylinders)* • calculate exactly with multiples of π • know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$, and apply it to find lengths in right-angled triangles in two dimensional figures	Students will sit a short diagnostic assessment at before the start of each topic to inform teaching. The unit will be followed by an end of unit assessment. These assessments are stored and marked on a system called MiniTest. This allows us to track the progress made throughout the topic. A copy of the end of unit assessment will be emailed to parents and students as well as being recorded in their work book.	**Literacy:** Circle, Pi Radius, diameter, chord, circumference, arc, tangent, sector, segment (Right) prism, cylinder Cross-section Hypotenuse Pythagoras' theorem **Thinking Skills:** Students are supported to develop high level problem solving skills, applying challenging mathematical concepts to a range of unforeseen, multi-step problems. They will also be encouraged to infer the meaning of new vocabulary and deduce different methods of working.	www.kerboodle.com www.mymaths.co.uk/ www.khanacademy.org/ https://campus.mangahigh.com www.bbc.co.uk/education/subjects/z38pycw https://nrich.maths.org/

| Module 6

Percentages | Kenny thinks that the interest gained when £100 is increased 20% per annum for 4 years can be calculated by multiplying £100 by 2.0736. Do you agree with Kenny? Explain your answer. | • solve problems involving percentage change, including percentage increase/decrease
• set up, solve and interpret the answers in growth and decay problems, including compound interest | Students will sit a short diagnostic assessment at before the start of each topic to inform teaching.

The unit will be followed by an end of unit assessment.

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A copy of the end of unit assessment will be emailed to parents and students as well as being recorded in their work book. | **Literacy:**
Percentage change, percentage increase, percentage increase Compound interest, Simple interest Terminating decimal, Recurring decimal (Exponential) growth, decay

Thinking Skills:
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