

Subject: Maths **Year** 10 **Ability** Higher

Half Term 5 / weeks	Week 1-2	Week 3-4	Week 5-6	
Topic	Unit 25 – Simultaneous quadratics and graphs of functions	Unit 26 – converting units and harder areas	Unit 27 – Percentage problems and interest	Reteach and Retention
Topic overview Pupils will learn...	Students should be able to create coordinate points and plot both quadratic and cubic graphs and solve quadratics simultaneous equations both algebraically and graphically.	To find the area/volume and surface area of harder 2D and 3D shapes before using this to complete density questions. Finally using the skills of scale factors and the use of LAV to convert units.	To recall and use percentage multipliers in the context of interest questions both simple and compound.	Focus on the process of reteach and retention, knitting together the learning in reaction to the assessments completed
Components	<ul style="list-style-type: none"> To accurately plot quadratics, cubic, exponential and reciprocal functions. To solve linear simultaneous equations. To solve simultaneous equations where one is linear and the other is a quadratic. To solve simultaneous equations graphically. 	<ul style="list-style-type: none"> To convert between measures of length, area and volume. To solve problems involving density, mass and volume. To find the surface area of 3D shapes. To find the volume of prisms. To calculate the area and perimeter of sectors. To calculate the volume and surface area of a cylinder. To calculate the area of a triangle using $\frac{1}{2}ab\sin C$. To calculate the area of segments. 	<ul style="list-style-type: none"> To increase and decrease an amount by a percentage. To calculate compound interest. To write formula to calculate compound interest. To solve reverse percentage problems. To set up, solve and interpret growth and decay problems. 	Staff complete a program of adaptive reteaching on specific topics based on the individual/class needs within their groups. Regular assessments are used to identify gaps in learning. Any gaps found are then addressed in lessons to help support learning and retention. Clear areas for improvement are monitored by individual staff and at a departmental level.
What pupils should already know (prior learning components)	Students should be able to solve quadratics and linear equations. Students should be able to solve simultaneous equations algebraically.	Students should know the names and properties of 3D forms. The concept of perimeter and area by measuring lengths of sides will be familiar to students. Students should be able to substitute numbers into an equation and give answers to an appropriate degree of accuracy. Students should know the various metric units.	Students should know the four operations of number. Students should have a basic understanding of fractions as being 'parts of a whole'. Students can define percentage as 'number of parts per hundred'. Students are aware that percentages are used in everyday life.	All the half term content will have been covered by this point. Staff will use departmental tracking documents to analyse the gaps in learning from the most recent assessments and all previous assessments. The ability to structure and breakdown a problem-solving question as exemplified in the TFI questions throughout the course.
Transferrable knowledge (skills)	The topic will build pupils' confidence with plotting and the use of substitution. The skills of plotting these values and understanding these more complicated graphs pulls together a number of lower skills. The students should be able to now use these skills to pull out information from	This unit will look to bring together a number of shape and space topics to put them into a real context that includes density and volume style questions. This unit will help to support other subjects such as science and other real world applications.	This unit looks at applying mathematical skills with percentages and applies them to real world problems including discounts, inflation and interest rates. All of these elements should be connected to life elements as much as possible throughout the unit.	This activity should serve to highlight and address areas of weakness in teaching and learning or retention. This early intervention to understand specific key areas for improvement or development. This should help to build confidence and

	graphical representations improving interpretation skills. Simultaneous equations will be repeated used at KS5 to solve increasingly difficult questions.			improve students' ability to answer these and directly sequential problems.
Key vocabulary pupil will know and learn	Sketch, estimate, quadratic, cubic, function, factorising, simultaneous equation, graphical, algebraic	Triangle, rectangle, parallelogram, trapezium, area, perimeter, formula, length, width, prism, compound, measurement, polygon, cuboid, volume, nets, isometric, symmetry, vertices, edge, face, circle, segment, arc, sector, cylinder, circumference, radius, diameter, pi, composite, sphere, cone, capacity, hemisphere, segment, frustum, bounds, accuracy, surface area	Addition, subtraction, multiplication, division, fractions, recurring, integer, decimal, termination, percentage, VAT, increase, decrease, multiplier, profit, loss, ratio, proportion	
Assessment activities	Year 10 Half term test 11 non-calc Year 10 Half term test 12 calc Homework Unit 25 – Simultaneous quadratics and graphs of functions	Year 10 Half term test 11 non-calc Year 10 Half term test 12 calc Homework Unit 26 – converting units and harder areas	Year 10 Half term test 11 non-calc Year 10 Half term test 12 calc Homework Unit 27 – Percentage problems and interest	AFL and adaptive teaching will continue to support staff to assess the address areas.
Resources available	MathsWatch clips – 140, 160, 161, 162, 179, 180, 211	MathsWatch clips – 112, 114, 119, 142, 149, 167, 203	MathsWatch clips – 46, 108, 109, 110, 164	Before any assessments are completed, revision and guidance materials are provided for students to assist in independent study.
Notes Why this topic is important...	This unit starts with students ensuring that they can generate points before plotting the graphs associated. Students should ensure they can sketch these including important information communicating these. Simultaneous equations builds on the linear skills taught earlier and moves into quadratic problems. These skills are used in all aspects of KS5. It might be useful to look at the use of more technical calculators that student can use at GCSE to make this easier.	This unit reminds students of 2D skills before moving to 3D ones. This will include sectors and segments using the sine formula for triangles. Questions should challenge ideas on accuracy with answers kept in terms of pi and surds where suitable. Once this is established students should be challenged to move this to density problems. The use of scale factors should be revisited through LAV when converting units in different dimensions.	Students should be reminded of multipliers for percentages, increase and decrease before looking at interest questions. A focus on comparisons of investments (simple/compound/multiple rates) should be made including working backwards to find given rates and original amounts. Links to real life including depreciation should be made where possible.	This is an important point in the curriculum plan that enables individual teachers to review the gaps in learning for the classes they teach. The half-termly assessments are used to track students' progress and enable teachers to react quickly to any gaps in knowledge and prepare students for the next assessment. The feedback and modelling of the exam answers enables students to pick up exam techniques and the ability to communicate effectively.