

Year 10 Foundation Scheme of Learning

Autumn Term

We begin the GCSE course by exploring different calculation methods to ensure students are numerically fluent. Students will be familiar with many of the topics covered here having previously studying them and it is designed to reinforce key concepts before applying the skills to problem solving. Topic areas such as integers, place value, rounding, handling negative numbers, decimals, indices and roots, factors, multiples and prime numbers all find their way into this unit. These numerical skills are essential to a number of later units and provide a basis to build upon throughout the rest of the course.

In the second unit we look at the fundamentals of algebra. We discuss the purpose of algebra before examining algebraic techniques such as collecting like Terms, expanding brackets, factorising, simplifying and working with indices. Developing algebraic fluency is essential in ensuring students are equipped to deal with the next topic on sequences where students learn to substitute into expressions and formulae. The skills learnt and practised within this unit will prove invaluable in underpinning upcoming topics on the course.

In the latter part of the Autumn Term we focus on statistics; providing students with the opportunity to explore the modern world in the context of data. This topic area raises questions about how to use numerical methods to demonstrate real life situations. Students consider how data can be represented and interpreted through the use of pictograms, bar charts, line graphs, stem and leaf diagrams, pie charts and scatter graphs. These charts provide opportunity for students to interpret and compare datasets and we take the opportunity to introduce, discuss and use the modal average. We deliberately avoid using the other averages, (mean and median) at this stage so as to avoid cognitive overload. These come up later in the year.

Spring Term

The Spring Term begins with a look at proportional reasoning; this unit includes fractions, decimals and percentages and builds on their understanding of numerical skills developed in the Autumn Term. This is an important unit in terms of building an understanding of the different ways of expressing numbers as fractions, decimals, percentages, ratio and proportion. We will also begin to look at using these skills in other contexts such as investigating change and growth; and problem solving.

The next unit builds on earlier work on algebra; students learn how to set up and solve equations and extend this skill to look at inequalities. Following this, students further extend their algebraic techniques, this time in the context of sequences. This unit forms a basis for looking at a number of future topics including simultaneous equations and graph drawing.

The next unit will look at the fundamentals of shape, space and measure. Students should see a certain familiarity as previous work on angles and shape properties are explored and reinforced. This will be extended as students look at angle facts and polygons, both regular and irregular. When assessed, this part of the curriculum often requires some quite technical numerical and algebraic skills to support the knowledge of angles and shapes. This unit also encourages students to develop their ability to show numerical and algebraic fluency in their written working out.

We complete the Spring Term by taking a look at statistics; providing students with the opportunity to explore the modern world in the context of data. Students will look at types of data before learning about calculations and use of averages. Whilst supported by previous work on tables and charts, this unit will extend students considerably as we consider how to calculate averages in different contexts and explain which type of average is best to use. Students will also need to be able to compare groups using averages and range.

Summer Term

The Summer Term begins with a look at perimeter, area and volume. Students study the perimeter and area of various shapes and will extend these skills by finding the surface area and volumes of some common 3D shapes and prisms. In addition to this, students will also develop their knowledge of the properties of different 2D shapes and 3D objects.

We then move on to a unit on graphs. Students will need the knowledge gained on algebra and the skills learned in the sequences section to draw graphs based on equations and on real-life situations. Identifying and interpreting gradients and other aspects of coordinate geometry are key elements of this unit. Whilst the focus is on straight-line graphs here, the foundations for other types of graph drawing, including quadratic graphs, will also be set.

The next topic is transformations. This involves moving or enlarging shapes using reflection, rotation, translation and enlargement. This unit builds extensively on previous work on congruence, similarity and symmetry and is revisited in Year 11.

We end the year with a look at ratio and proportion. This important unit will require extensive revision of previously visited numeracy skills and fraction, decimal and percentage work covered earlier in Year 10. The problem solving element to this topic lends itself to algebra and geometry. This provides students with the opportunity to end the year tackling the type of multi-faceted exam questions they will ultimately be answering in their GCSE exams at the end of Year 11.