

Mathematics Curriculum Rationale

Introduction

As a department, we endeavour to instil a genuine interest in mathematics from a young age, by giving students opportunities to develop key skills, enabling a more comprehensive understanding of the subject as they progress through the curriculum. We link mathematics to real-world situations promoting problem-solving in an attempt to make the subject relevant and tangible.

We introduce mathematical terminology from KS3 resulting in greater fluency and less misconceptions.

In an attempt to build confidence in a subject where many feel 'out of their depth', we structure the 'we do' session of our direct instruction lessons very carefully with the use of mini whiteboards to evaluate the understanding of the topic while building confidence.

Knowledge in maths

In the mathematics department, we follow a 3 year scheme of work in year 8 to 10 from the AQA exam board.

Students in year 7 follow a carefully planned 'mastery' year, gaining core knowledge in basic concepts such as addition, subtraction, multiplication, division, place value, fractions, negative numbers, basic algebra and basic geometry.

Mathematics is primarily a cumulative subject with hierarchal elements. These hierarchal elements tend to be stand-alone topics which build rapidly upon 'singular' knowledge. The mathematics curriculum consists of 6 strands, namely: (1) algebra, (2) geometry & measure, (3) number, (4) ratio, portion and rates of change, (5) probability and (6) statistics.

Due to a greater demand on students' knowledge and recall skills across other linked subjects, for example, maths/science, we are working together to on key facts – such as formula – to ensure students are taught the formula in the same way, thereby improving recall skills and reducing the amount of memory space required to store information.

Alongside the subject content there is an expectation that students will be “working mathematically” towards the three aims of the curriculum

- **Fluency** – become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- **Reasoning** - by following a line of inquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- **Problem Solving** - can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Gaps in pre-requisite knowledge should be identified and best practice should then take account of these gaps in planning

and teaching.

We have one scheme of work to ensure there is no ceiling on progress and learning. Students can be pushed onto higher content where appropriate. Teachers will have longer to teach topic areas to ensure the develop understanding and embed the three core skills, fluency, reasoning and problem-solving.

Review of the scheme will commence through the academic year to ensure best provision. Assessments are the same across the MAT to monitor the progress of students and time given to fill the gaps identified.

Key stage 4

Our curriculum strategy has been devised to maximise the potential of all pupils regardless of ability. Students *are set* from year 7, allowing them to progress at their own rate of understanding yet are able to move between sets as this improves.

KS4 consists of preparing year 10 and 11 students for their GCSE exams by closing the knowledge gaps, working on exam technique, memory recall and significantly improving problem-solving skills, bringing together all the hinterland information learned to date.

We know mathematics is a coveted subject which employers, universities and colleges rate highly when considering applications. As a result, we provide a significant amount of additional support to ensure students are in the best position achieve their targets and follow their chosen career paths. This includes 1-2-1 sessions, access to mathswatch online, revision workbooks with built-in support, as well as short, intensive consolidation programmes designed to recap prior knowledge.