

NHGS – Mathematics - Curriculum Intent, Implementation and Impact

Intent (Aims and purpose)

We aim to create the very best Mathematicians. We challenge students to think, act and speak like those working in the field would. We do this by quality first teaching which ensures students understand underlying Mathematical principles and can apply them in a variety of familiar and unfamiliar contexts. We teach content in its totality and constantly refer to the 'why' techniques work, encouraging students to make connections between ideas and topics.

Our curriculum at NHGS goes far beyond what is taught in lessons, for whilst we want students to achieve the very best examination results possible, we believe our curriculum goes beyond what is examinable. As a department we offer opportunities for individual and team competition through the UKMT in years 8, 10 and 12/13. We provide access to Maths inspiration events for our Highest achieving KS4 students. We offer KS5 students visits to local universities through the Leeds Festival of Science and residential courses at the University of Leeds and Manchester. KS5 students also have access to problem solving courses and STEP courses provided through the AMSP.

Our curriculum in Mathematics forms a backbone to our ethos statement. Examples of how our curriculum supports the ethos statement are by providing real stretch and challenge and opportunities for collaborative thinking, as well as space for independent thought and creative solutions. Students are explicitly taught strategies to solve problems and are encouraged by teacher modelling to be able to express themselves in Mathematical language.

As a knowledge engaged curriculum we believe that knowledge underpins and enables the application of skills; both are entwined. As a department we define the powerful knowledge our students need and help them recall it by use of module checklists and in some cases knowledge organisers. Students have individual notebooks separate to their exercise books for recording model solutions. Use of regular diagnostic quizzes, and assessment for learning particularly using mini whiteboards is a common feature of Maths lessons. Each year group from Y9 upwards has a designated whole year group Revision Google classroom with a wealth of exam and test information and revision resources. All students have individual Mathswatch login codes to access homework tasks and structured revision for assessments.

We build the Cultural Capital of our students by whole year group events such as Enigma Day for year 7 where students learn about the history of codes and encryption from ancient civilisations up to the present day. Through our curriculum we introduce students to the stories of some of the most influential Mathematicians throughout history and the impact that their work has had on the world we live in. Real life applications of Mathematical ideas are made explicit to students whenever possible.

Further rationale behind our curriculum design includes trying to make learning stick by having a spiral curriculum. The five main areas of number, algebra, ratio, geometry and data are taught in a cycle. Each time students revisit an area, they are exposed to more complex content, building on what they have already learnt. We ensure the level of challenge is high enough for the most able, with scaffold and support available for students who need it.

Implementation

Collaborative curriculum planning lies at the heart of what we do in the department. We are committed to a three-year plan of developing our schemes of work. In 2019/2020 we are working on KS4 schemes of work. These are focussed on embedding challenge, metacognition, memory techniques and literacy into our departmental curriculum

Alongside our schemes of work, we are developing knowledge organisers at KS3. This is enabling us to define the core knowledge our students need to master.

In Mathematics we also implement our curriculum through using a variety of teaching approaches and tasks such as treasure hunts, relay tasks, competitive game based activities and problem solving as well as more traditional skills practice and skill checkers. Key skills and knowledge are constantly revisited and key terminology is regularly embedded within lessons and in the written work that our students produce. Students are challenged to build on fundamental concepts by structured extension activities.

Impact

We know our curriculum is working in the Mathematics department through analysis of the school GCSE results . Maths average points score is consistently one of the highest for all subjects in the school and the Maths residual continues to be positive indicating students achieve high grades in Maths compared to their other subjects. Maths continues to be a very popular option in KS5 with between 60-80 students choosing it as one of their 3 A level subjects. We also continue to have healthy take up for A level Further Maths. Sixth form students like to give back to the department by helping to mentor and support students in KS3 and KS4 in many ways such as running Level 3 algebra award sessions with Y10 and helping with Y9 Booster group. Departmental Quality Assurance shows students taking pride in their work in Mathematics, and enjoying the level of challenge and variety of learning activities.