



## MATHEMATICS

### Curriculum Intent, Implementation and Impact

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#### Intent

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 required for the specifications, for whilst we want students to achieve the very best examination results possible, we believe our curriculum goes beyond what is examinable. High achieving KS4 students are given the opportunity to gain an extra qualification in Mathematics. KS5 students have access to help for preparation for MAT and TMUA examinations as well as access to STEP courses provided through the AMSP. As a department we offer opportunities for competition through the UKMT in years 8, 10 and 12/13.

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, through teacher modelling, to be able to express themselves using Mathematical language.

As a knowledge engaged curriculum we believe that knowledge underpins and enables the application of skills; both are entwined. We carefully sequence the key knowledge and skills in the different components in our spiral curriculum, where topics are revisited across the main areas of number, algebra, ratio, geometry and data which 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.

We build the Cultural Capital of our students 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.

## **Implementation**

Collaborative curriculum planning lies at the heart of what we do in the department. The development of the KS3 and KS4 Schemes of work is focussed on embedding challenge, metacognition, memory techniques and literacy into our departmental curriculum . We are now concentrating on further development of the KS5 scheme ensuring it has high quality resources that are accessible to all staff teaching any part of the curriculum. Alongside our schemes of work we have knowledge organisers across KS3 and KS4. This is enabling us to define the core knowledge our students need to master.

We teach students in mixed ability groups in years' 7 and 8 before setting the students in Year 9 to 11. All students are taught the whole syllabus and content is covered at the same time. Lower ability groups are in smaller classes and cover the work at a slower pace but are still able to access Grade 9 as confidence grows.. Larger groups of higher ability students have more stretch and challenge.

In Mathematics we define the powerful knowledge our students need and help them recall it by use of throwback starters and skill-buster skills. Students have individual notebooks separate from 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 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. KS4 and KS5 students have individual logins for the Dr Frost platform. We ensure good engagement of the students using treasure hunts, relay tasks, competitive game based activities and problem solving as well as more traditional skills practice and skill checkers. As a department, we set regular homework which is in line with the school homework policy. We follow a spiral curriculum which includes throwback lessons built into the scheme of work. We regularly revisit key skills and knowledge through a mix of starters and homework. Key terminology is regularly embedded by modelled examples from the teacher and can be seen in the written work that our students produce. Students are challenged to build on fundamental concepts by structured extension activities.

We offer support sessions to all our exam groups with daily KS5 'drop-in' sessions with an A level teacher as well as specific KS4 revision sessions.

## **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 as a fourth A level. We have a 5 year curriculum in Mathematics and begin to deliver the GCSE units at the beginning of Year 9.

Our sixth form students like to give back to the department by helping to support our students in KS3 and KS4 in many ways such as; helping in lessons and running an extra qualification of Level 3 Algebra to year 11 students who are either wanting to improve their algebra skills or looking to study A Level maths. Departmental Quality Assurance shows students taking pride in their work in Mathematics, and enjoying the level of challenge and variety of learning activities.