

Maths - Higher Quality Learning



Ensuring students understand the context and the learning expected.

'Every Child a Mathematician' – we believe that every student has the capability to be a successful learner in Mathematics. We seek to develop students' fluency, numeracy, reasoning and problem-solving skills to enable them to have a deeper understanding of the mathematics which permeates the real world.

Lessons are planned with clearly defined objectives and learning is carefully sequenced across schemes of learning (e.g. fractions) to allow students to achieve their full potential, building and securing mathematical knowledge and skills systematically. Objectives are shared with students in several different ways. While not all students will reach high attainment in mathematics, we seek to develop all students as successful learners of the subject, and to ensure they leave sufficiently equipped to cope with the essentials of everyday life.

Lessons will have different structures, depending on their type:

The 4-part lesson - Connect, Activate, Demonstrate, Consolidate

Lead in lessons - More questioning, discussions and guided discovery

Consolidation Lessons - More time for independent learning/group learning on set tasks

Investigative Lessons – (No specific, publicly shared learning outcomes, a rich task or prompt leads to discovery learning)

Reference books are used across from year 7 to year 11 to develop independence and help students make connections with what they're learning across the curriculum.

Focus



Challenge

Meeting the needs of all learners in order to build confidence, provide challenge and ensure success.

Lessons in **year 7 and year 8** provide a deeper understanding as to why methods are used. Students have equal opportunity to access the fluency, reasoning and rich, problem-solving activities. **Year 9** acts as a transition year, providing time to revisit and consolidate of the key concepts from KS3, and prepare students for GCSE. **Key Stage 4** begins in year 10, with appropriate use of exam style questions. Throughout the years, a variety of tasks are used in lessons including: paired work, group tasks, mini-whiteboards, loop cards, and worksheet/textbook exercises. In all lessons, teachers use annotated seating plans to help identify key learners and their needs.

Students are trained to be self-aware, using the Red-Amber-Green (RAG) cards in their planners to communicate their learning needs and the learning cycle is designed to encourage self-reflection and learners who take ownership of their progress. Alongside the use of RAG cards, teachers use their expertise and knowledge of each students' individual needs to provide, additional challenge, support and differentiation where appropriate.

A variety of representations (e.g. bar models) and manipulatives (e.g. algebra tiles) are used to support understanding of mathematical concepts across all stages of learning. The use of mathematical language is promoted in all lessons – key words and terminology – and sentence starters add, build, justify and challenge encourage rich conversation and discussion.



Assessment

All students know how to improve, progress is reviewed regularly and feedback supports improvement.

Assessment is a key part of our approach to supporting our students. In lessons, a variety of AFL tools (RAG cards, voting, mini-white boards etc.) are used to identify misconceptions and assess learning. Our learning cycle is used to set out the expectations for students, staff and other stakeholders in this process. Students at all stages self-assess work regularly, and peer-assess on some pieces. Teachers regularly provide verbal feedback during the lesson (to individuals, groups or the whole class) in response to misconceptions that are identified as well as praising good work and highlighting points for attention. Students respond to feedback using a green pen. Marking codes are used by both teachers and students. Further detail about how we give feedback can be found in the Feedback Policy.

Our Diagnostic, Therapy, Test (DTT) cycle is similar at both Key Stages. Students do not get scores, but get a pre-test feedback with shading showing how well they completed the question to promote a focus on improvement (and not simply attainment). Teachers get a full PLC for the whole class to help with preparation and differentiation. In years 7 and 8, post-test feedback is given by Assessment Analysis (AA) sheet showing percentage gain to emphasise the progress made over the unit of work. Pre-tests in year 9 onwards focus on fluency questions, asking students to recall connected learning from previous units of work. In years 10 and 11 the post-test generates an AA sheet and an estimated grade. Post-test PLCs are produced for the teacher to aid exam preparation. KS4 post-tests use carefully selected GCSE reasoning and problem-solving questions. Units are split into smaller sets of learning outcomes, and these have an AFL sheet with students self-assessing their pre-teaching and post-teaching understanding. Following any post-test, students undertake 'Improvement Activities', to enhance their understanding of areas of weakness. A 'green pen' re-work of the test is expected to see if their intervention has been effective. Where students need additional intervention, worked solutions are completed using purple pen.

Creating a positive climate of learning, behaviour and engagement.

Mixed attainment teaching, leads to a supportive learning environment. For example, the use of 'Add, Build, Justify and Challenge' sentence starters encourages students to become better at listening and supporting one another. Teachers work hard to create an atmosphere where students are encouraged to 'have a go', make mistakes and learn from them. Lessons start with a connect/starter activity to focus students on prior learning, or to prepare for new learning.

Our belief is that all students can become **successful learners** of mathematics. Supportive questioning and class discussions and the use of reference books to 'collect' mathematical skills and knowledge, help overcome 'maths anxiety', and boost the confidence and enjoyment of students. **My Progress** points may be earned by: demonstrating improvement; or working on extension tasks. **My Learning** points for: explaining the reasoning behind a solution; or justifying answers.

Confident Individuals deep mathematical discussion, and use of reasoning and problem-solving tasks allows all students to develop mathematical confidence. They can become **reflective and resilient** learners who are willing to take risks, make mistakes and learn from them. **Getting Involved** points for: participating in whole class discussions; or completing challenges (e.g. Challenge wall, Nrlich and UKMT). **My Well-Being** for: being PROUD of their work; seeking help, showing patience or resilience; being "maths positive". Being **Responsible Citizens** is developed in lesson by encouraging mathematical discussion between students and modelling students listening to, and helping each other to develop their understanding. **Citizenship** points for: offering to help staff/students; or sharing understanding with others. **Teamwork** points for: working well with others; taking the lead in a group, or making sure all can contribute.

Where encouragement and support do not produce the required attitude and behaviour, standard school sanctions will apply. Students persistently misbehaving in maths may also be put on a subject report, or be asked to take part in a restorative chat.

Developing the language fluency and learning skills students need to access learning and make progress.

In all lessons, students can access fluency, reasoning and problem-solving activities. Students are involved in deeper discussions that develop understanding and have access to rich problem-solving activities.

Students should: become **fluent** through varied, frequent practice, developing conceptual understanding and rapid, accurate recall and application of knowledge; **reason mathematically**: follow lines of enquiry, conjecture relationships and generalisations, develop arguments, justify or prove results, using mathematical language; **solve problems** exploring problems with increasing sophistication, breaking them down and persevering in seeking solutions; be **reflective and resilient** learners who are willing to make mistakes and learn from them; **understand** how and why methods are used, selecting **efficient** ways to solve problems.

'Methods for fluency' are developed through Key Stage 3 and Key Stage 4 (e.g. the RASCAL method) and the use of 'real world' problem solving examples helps students to make connections between different mathematical ideas and to anticipate practice problems they are likely to face in adult life.

The use of Home Learning (particularly Retrieval tasks) provides important opportunity for students to revisit previously learned knowledge, concepts and procedures.

Our School Intent: At Fernwood, we value the contribution all individuals make to our family. We strive for success, we support all and we nurture potential through a culture of high achievement, care and discipline.



Focus
Challenge
Assessment
Climate
Fluency