



Mathematics at The Bridge

Aims and objectives

All students at the Bridge are prepared for their final GCSE Mathematics examination in Year 11. Whilst recognizing the individual needs of our pupils and knowledge gaps, we provide them with a Mathematics Curriculum that parallels practice in mainstream schools and give them consistent expectations in a Mathematics lesson. We follow The Bridge ethos of Hope and a Future and aim to inspire a positive attitude and confidence in all our pupils. Delivery of curriculum fulfils the [Unique Me characteristics](#) we wish every student to develop during their time with us, aiming to equip our students with the following skills –

- [Developing healthy habits](#) - To develop evaluation and target setting skills
- [Knowing myself](#) - To develop the pupils own self-assessment
- [Connecting to others](#) – To co-operate with other students in problem-solving activities and mathematical games
- [Being financially aware](#) - To be informed about currency exchange, money related operation, and overall to be able to apply mathematical skills in everyday financial planning
- [Finding fulfilling work](#) – to have an educational experience that leads into finding a fulfilling role
- [Lifelong learning](#) –to enable student’s engagement in processes of exploration, conjecture, logical reasoning and communicating for life and enable the student to be independent member of the community

Teaching and learning styles

We use a range of teaching and learning styles. The teacher explains, and models the topic that is being taught, addressing misconceptions and assessing for learning. Scaffolding is used for students who benefit from such a structure while some students take on independent learning. Within a class there are Foundation and Higher levels to be covered as well as differentiation according to the needs of the pupils and gaps in knowledge. The nature of students at the Bridge is that they come from different schools which follow different curriculums as well as significant periods of absence. All the gaps are acknowledged and individual interventions are planned. Classes have a maximum of six students to encourage full participation in discussion and enable individualized learning to take place. Mathematics trips are organized to further support the delivery of the curriculum.

Mathematics planning

Mathematics has many cross-curricular links with other subjects taught at The Bridge. Food lessons overlap with the topic of ratio and quantities; ICT lessons overlap with various presentations of data. Geometry and Art lessons teach about different types of perspectives, the concept of tessellations is further explored in Arts. Mathematics lessons are delivered four times per week for Year 10 and Year 11 students and three times per week for Year 9 students. Students are prepared for their final GCSE exam while they acquire mathematical skills for life through logical reasoning, and problem-solving. Lessons are parallel to the mainstream practice and students are assessed with an end of Year 10 exam as well as February mocks for Year 11. Within the school year some students receive additional lessons according to their gaps in education and previous attendance.

Topics covered for Foundation Level GCSE are:

- Integers and place value
- Decimals
- Indices, powers and roots
- Factors, multiples and primes
- Algebra: the basics
- Expressions and substitution into formulae
- Tables, charts and graphs
- Pie charts
- Scatter graphs
- Fractions, decimals and percentages
- Percentages
- Equations and inequalities
- Sequences
- Properties of shapes, parallel lines and angle facts
- Interior and exterior angles of polygons
- Statistics, sampling and the averages
- Perimeter, area and volume
- Real-life graphs
- Straight-line graphs
- Transformations
- Ratio
- Proportion
- Right-angled triangles: Pythagoras and trigonometry
- Probability
- Multiplicative reasoning
- Plans and elevations
- Constructions, loci and bearings
- Quadratic equations: expanding and factorising
- Quadratic equations: graphs
- Circles, cylinders, cones and spheres
- Fractions and reciprocals

- Indices and standard form
- Similarity and congruence in 2D
- Vectors
- Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations

Topics covered for Higher Level GCSE are:

Calculations, checking and rounding

- Indices, roots, reciprocals and hierarchy of operations
- Factors, multiples, primes, standard form and surds
- Algebra: the basics, setting up, rearranging and solving equations
- Sequences
- Averages and range
- Representing and interpreting data and scatter graphs
- Fractions and percentages
- Ratio and proportion
- Polygons, angles and parallel lines
- Pythagoras' Theorem and trigonometry
- Graphs: the basics and real-life graphs
- Linear graphs and coordinate geometry
- Quadratic, cubic and other graphs
- Perimeter, area and circles
- 3D forms and volume, cylinders, cones and spheres
- Accuracy and bounds
- Transformations
- Constructions, loci and bearings
- Solving quadratic and simultaneous equations
- Inequalities
- Probability
- Multiplicative reasoning
- Similarity and congruence in 2D and 3D
- Graphs of trigonometric functions
- Further trigonometry
- Collecting data
- Cumulative frequency, box plots and histograms
- Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes and quadratics
- Circle theorems
- Circle geometry
- Changing the subject of formulae (more complex), algebraic fractions, solving equations arising from algebraic fractions, rationalising surds, proof
- Vectors and geometric proof

- Reciprocal and exponential graphs; Gradient and area under graphs
- Direct and inverse proportion

Teaching Mathematics to students with special needs

At The Bridge, we teach Mathematics to all students, regardless of their ability. We provide learning opportunities matched to the individual needs of each student, including those who are gifted and talented or have learning difficulties. When planning and delivering Mathematics and providing feedback to students, any EHCP (Educational, Health and Care Plan) IEP (Individual Educational Plan) and SEND (Special Educational Needs and Disabilities) are taken into account. Students who are not able to access GCSE level Mathematics are taught at Entry levels or Level 1/2; according to baseline, the appropriate teaching level is chosen.

Assessment and recording

Students access direct teaching of mathematic principles. That is followed by practice and consolidation exercises. The teacher assesses student's processes and applications of knowledge and understanding and provides feedback to the students within the lesson. Reviewing and assessing teaching and learning is done within each module as well as on a termly basis with the end-of-term tests. In lessons, students use green, yellow and pink colour coding to annotate their understanding of the topic. The teacher provides feedback with a What Went Well (WWW) and Even Better If (EBI) format and students improve the work or provide corrections. Assessment may be self/peer or teacher-based. Achievements of pupils in Mathematics are reported to parents twice yearly, in December and July.

Resources

We follow the GCSE Mathematics scheme of work. Differentiated resources are taken from websites such as Twinkl, Maths Made Easy and TES. The Bridge has access to Pearson workbooks for Foundation and Higher Level GCSE Mathematics and MathsWatch. According to topics taught, the Mathematics classroom is supplied with tracing paper, rulers, calculators, compasses, measuring tapes, Numicons and many other supportive resources.

Monitoring and review

The Bridge Teaching and Learning Co-ordinator (David Turrell) is responsible for monitoring the standard of student work and the quality of teaching. Klara Stravs is responsible for the delivery of the Mathematics curriculum. The development of the Mathematics curriculum is reviewed annually by the Head of School and professional development needs are identified.