Mathematics Programme of Study

When a student leaves a Genesis Education Trust school at eleven they are confident, independent mathematicians with the knowledge and skills to be successful at secondary school. To ensure every student is successful we focus on three key variables: curriculum design, teaching and student placement.

Systematic curriculum design is essential for effective teaching of mathematics. Lessons must build upon prior learning and progress toward a clear goal. Lessons at GET schools meet this standard because they are based on curriculum maps. A curriculum map establishes the basic requirements for each year group: the instructional schedule (what to teach and when to teach it), the difficulty level and the progression of skills. Curriculum maps lead to effective lesson planning, effective lesson planning leads to outstanding teaching which leads to academic success.

To ensure students are taught at the correct instructional level, and receive the support they need, they are placed in a stream according to their current attainment. Student placement is based on summative assessment – termly tests – and ongoing teacher assessment. Students and teachers know that placement is flexible: if a student would benefit from moving to another stream, they are moved promptly. This means that students always receive the help, and challenge, they need to succeed.

Teaching is based on research validated practices. Every lesson contains review of prior material, clear modelling of new material and application problems. Lesson tasks are separated into three categories: Check it, Think it and Master it. These categories correspond with the 3 essentials of a high-quality mathematics education outlined in the National Curriculum: fluency, mathematical reasoning and problem solving. Teachers teach engaging, fast-paced and challenging lessons which means that children are ready for the next lesson and make good progress.

How we teach mathematics in Reception and key stage 1 – years 1 and 2

In Reception and key stage 1, new material is taught according to the principles of Jerome Bruner's concrete, pictorial and abstract schema (CPA). Teaching begins with hands-on activities, progresses to pictorial representations before, finally, becoming abstract. Our calculation policy provides examples of what this means in practice.The policy shows the steps children will take on their way to mastering the four operations for example. Our approach means that every child has a sound understanding of the principles behind fundamental mathematical concepts.

At this stage it is crucial children learn number bonds to 20 and recall them with fluency. For this to happen, we teach number bonds during mental arithmetic lessons and provide children with regular review and practice.

Due to our commitment to the CPA approach, and because of the emphasis we place on the teaching of number bonds, children leave key stage 1 with the knowledge and skills they need to be successful in key stage 2.

How we teach mathematics in upper key stage 2 – years 3 and 4

Lower key stage 2 is a crucial stage in the development of students' mathematical understanding. To ensure successful transition, work in Key stage 1 is built upon, while work in upper key stage 2 is prepared for. As in key stage 1, problem solving and reasoning are a part of *every* lesson. In research literature the difference between reasoning and problem solving is not always clear; indeed, the terms are often used synonymously. This is not the case at our schools. We see the two as distinct but mutually reinforcing: reasoning develops problems solving, problem solving develops reasoning. What does mathematical reasoning look like? Reasoning always begins with a question: *why? How do you know? Is there a more efficient approach?* Students are not only expected to answer these questions, but to ask them *themselves*. Our students are always asking these questions because every lesson involves problem solving and reasoning tasks. Problem solving always begins with a task which requires the application of a concept - or, more often the case, multiple concepts - to solve.

Fluency with number facts is fundamental to mathematics and therefore fundamental to our teaching. In regular mental arithmetic lessons, number facts are taught, reviewed and assessed. If students are motivated then they will learn times tables quickly. Students are motivated to learn times tables because we use Times Tables Rockstars. Therefore by the end of year 4 our students have memorised their multiplication tables.

How we teach mathematics in upper key stage 2 – years 5 and 6

As a consequence of our curriculum design, teaching and student placement, students enter upper key stage 2 ready to excel in the final 2 years of their time at primary school. By this time in their academic journey, our students are confident, independent mathematicians with all of the skills they need to succeed at secondary school.

[1] https://www.stmaryscofe.org/curriculum/