



**Northstar New School – How do we teach Mathematics?  
2022-2023**

**Intent**

At Northstar New School we aim to teach children how to make sense of the world around them by developing their ability to calculate, reason and solve problems. We aim to support children in achieving economic well-being by equipping them with a range of computational skills and the ability to solve problems in a variety of contexts .

Our aims in the teaching of mathematics are:

- to promote enjoyment of learning through practical activity, exploration and discussion;
- to develop confidence and competence with numbers and the number system;
- to develop the ability to solve problems through decision-making and reasoning in a range of contexts;
- to develop a practical understanding of the ways in which information is gathered and presented; to explore features of shape and space, and developing measuring skills in a range of contexts;
- to help children understand the importance of mathematics in everyday life.
- to become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

**Implementation**

Teachers are provided with Planning, Preparation and Assessment time (PPA) weekly in order to plan the specifics of their curriculum.

At our school, we teach mathematics to all children, whatever their ability or individual need. We provide learning opportunities that enable all pupils to make good progress. Every child has an equal right to be taught mathematics, in daily lessons of approximately 1 hour. There may be times when it is more appropriate for Key Stage 3 sessions to be over an hour.

We aim for children to master the key areas and domains in Mathematics, narrowing the gap between the most and least able learners. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged to deepen their understanding by being offered rich and sophisticated problems and not accelerate through to new content.

Mathematics is a symbolic, abstract language. To decode this language, symbols need to come alive and speak so clearly to children that it becomes as easy to understand as reading a story. We believe that all students, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking the concrete-pictorial-abstract approach.

**Concrete** – students should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.



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**Pictorial** – students should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.

**Abstract** – with the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence.

All classrooms have some concrete resources that can be used in the teaching of mathematics. Some more topic specific resources are located in a central location.

During our daily lessons we encourage children to count aloud, practice fluency, problem solving and reasoning skills and ask mathematical questions. We develop their ability to independently select and use appropriate concrete apparatus to support their conceptual understanding and build procedural fluency. They have the opportunity to independently access and use a wide range of resources to support their work. We develop the children's ability to represent problems using visualisation skills, including jottings and pictorial representations. ICT is used in mathematics lessons for modelling ideas and methods. Wherever possible, we provide meaningful contexts and encourage the children to apply their learning to everyday situations. Although mathematics is best taught discretely, it has many cross-curricular links. Teachers need to use opportunities in other subjects to rehearse skills in a context. Mathematics involves developing confidence and competence in number work, geometry, measures and statistics and the using and applying of these skills.

All classrooms will have a display area specifically for mathematics. This is called a working wall and will display items that children need to support and develop the unit's learning. For example, key vocabulary, success criteria, models, key questions.

### **Health and Safety**

Equipment will be used safely and appropriately. Specifically:

- Short pencils on compasses
- Pupils will not lift heavy objects or multiple weights in excess of 5kg to avoid strain to back muscles.

### **Special Educational Needs Disability (SEND) / Pupil Premium / Higher Attainers**

Children may have work additional to and different from their peers in order to access the curriculum dependent upon their needs. As well as this, our school offers a demanding and varied curriculum, providing children with a range of opportunities in order for them to reach their full potential and consistently achieve highly from their starting points.

### **Impact**

Assessment for Learning is fundamental to raising standards and enabling children to reach their potential. Assessment in mathematics takes place daily using a range of strategies such as marking and feedback of work and verbal discussions with children.

At Northstar teachers mark in purple pen. Correct answers are indicated by a  $\checkmark$  and incorrect answers may be identified and discussed with children where appropriate. Some wrong answers may be part of the process a child goes through to solve a complex problem. Children are then given time to respond to marking in green pen, usually with a teacher during daily practice. All



corrected work is re-marked to ensure it is correct. Children may self/peer assess, which is completed in a green pen, this allows them to have immediate feedback on their work.

Assessment of learning is formally completed termly using Puma, according to the individual's abilities. End of the Unit testing is completed. At the end of the year an assessment will be completed which reviews the whole academic years' objectives. Teachers use assessment information to inform their planning by using pre assessments. Moderation of teacher assessment is completed termly after formal assessments in order to ensure judgements are accurate. Records are kept by staff. Children are formally tracked using our tracking grids. This data is used by the teachers and Senior Leadership team to review children against Age Related Expectations based on their Key Stage starting points. Children who are not on track are identified for intervention/target teaching.

### **Leadership and Management**

The DHT's role is to empower colleagues to teach mathematics to a high standard and support staff in the following ways:

- By keeping up to date on current issues; disseminating relevant information and providing training for staff members (either directly or through other professionals)
- Leading by example by modelling lessons or styles of teaching
- Having a knowledge of the quality of mathematics provision across the school and using this to provide a coaching and mentoring role
- Identifying and acting on development needs of staff members
- Monitoring expectations, provision and attainment across the school and providing feedback to develop practice further in order to raise standards
- Providing necessary equipment and maintaining it to a high standard

### **Monitoring and Evaluation**

The quality of teaching and learning is monitored as part of the appraisal process through lesson observations and through the progress and attainment documents. In addition, continuity and progression across the school is monitored by the SLT as is the implementation and impact of Assessment for Learning. The mathematics action plan identifies actions intended to raise standards.

The DHT will also provide an annual summary report to the Headteacher in which s/he evaluates the strengths and weaknesses in mathematics and indicates areas for further improvement.

A named member of the governing body is briefed to oversee the teaching and learning. The governor meets, at least termly, with the SLT to review progress.

### **Partnerships with parents**

Parents are kept informed of topics that are being covered through a newsletter sent half-termly. During Parents' Days curricular targets are shared and a written report is completed annually in the Summer Term. Homework is a choice of activity; they are encouraged to complete an English/mathematics choice on alternate weeks.