The Teaching of Maths at Newfield

This policy describes the practice in the teaching of Maths at Newfield school for semi-formal and formal learners up to the age of 16.

Prior to embarking on a semi-formal pathway, pre-formal learners at Newfield develop skills in cognition and learning, communication, physical and sensory and independence skills. This enables them to learn through exploration and play, giving them transferable skills for if and when they are ready to move onto the semi-formal curriculum. The cognition and learning section of the curriculum in particular develops early Maths skills including simple problem solving and cause and effect.

We also offer next steps for our learners via our 'Pathfinders Skills', for those who are still working at pre-formal level but are starting to engage in more subject specific activities. These can be found at the beginning of our Maths Skills Framework and cross reference Routes for Learning, merging into our semi-formal curriculum.

Aims

Quality teaching of Maths *"provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject." (Maths National Curriculum)*

The teaching of Maths at Newfield School is therefore designed to be engaging and accessible to all our Semi-Formal learners. We aim to build on skills and knowledge guided by the National Curriculum and use resources from the White Rose Maths scheme, visual supports and practical activities to capture our learners' attention and aid their understanding. Cross curricular links and opportunities to embed Mathematics into the everyday are capitalised to develop a love and enjoyment of Maths.

By building on prior knowledge and skills each year we aim to develop declarative knowledge, aiming for fluency and confidence across all areas of Maths and via cross-curricular links. Over time our learners will develop procedural knowledge, aiming to recognise and use methodology to complete practical tasks. Repeated exposure over the school year and across key stages supports the development of procedural fluency. Pupils work towards the application of this knowledge using conditional knowledge, focusing on reasoning skills and problem solving to complete Functional Skills Examinations and solve problems in everyday situations as they prepare for adulthood.

Planning and the curriculum

The Newfield Maths Curriculum is modelled on the work of the 2014 National curriculum and EYFS framework, taking elements from the White Rose Maths scheme of learning. This, alongside Long- and Medium-Term planning to ensure breadth of coverage, informs lesson planning.

Due to the varying and often complex needs of learners at Newfield School, pupils follow individual schemes of work throughout their education with us to ensure sequential and progressive building of knowledge and skills at all ages and phases of their education, rather than setting out expected

outcomes by age. Maths is taught to Semi-formal learners as a discrete subject throughout the key stages, with activities and applications developing over time to suit the changing needs of our learners as the grow with us.

We teach the three main areas of Maths through the year, with the addition of statistics, breaking each area down appropriately, these are;

Number

- Number and Place Value
- Addition and Subtraction
- Multiplication and Division
- Fractions

Measurement

- Time
- Money
- Size
- Volume and Capacity
- Weight and Mass
- Temperature

Geometry

- 2D and 3D shapes
- Patterns
- Position and Direction

What does Maths look like at Newfield School?

Explorers

Mathematics is covered through a range of experiences; including using songs and rhymes, role play, construction play, shape toys such as shape sorters, jigsaws and puzzles and linked to topics throughout each year to ensure a broad range of experiences. Mathematics is embedded into all areas of the curriculum and practitioners ensure to use mathematical language during daily routines and activities. Play provision provides opportunities for pupils to explore applications of mathematics through a wide range of play opportunities. Teachers consider how to use pupils' interests to engage them in their play and model skills to pupils during these times.

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding,

children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

The key areas of mathematics and the broad skills and knowledge pupils will be working towards are outlined below. The long-term maps show how this is focused on across each year and the time commitments to this. However, although there will be opportunities for direct teaching, these skills will be practiced and revisited regularly through play provision and adult interactions.

Number and Number patterns

Composition of Number

Learning to count confidently and develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. They will develop a secure base of knowledge and vocabulary where achievable.

Geometry
Developing recognition and knowledge of shape and space including spatial awareness. Acquiring key vocabulary to support the description and discussion of key spatial concepts observed in everyday activity.

Measurement
Using a range of tools and practical devices to compare and describe using measurement terminology including length, height, mass, weight, capacity and volume. Developing awareness of Time through routines and sequencing and understanding of Money through exploration of coins and exchange.

This is delivered in a cross-curricular manner, where Maths is embedded throughout the day in play activities, meaningful interactions with adults and in short, planned group activities.

Key Stages 1-3

During Key Stages 2-3, learners increase teacher led lessons, ensuring that the discrete Maths lessons remain developmentally engaging and age appropriate. Mathematical concepts and mathematical language are introduced at appropriate stages matched to each learner's ability, particularly as the learner moves towards a more formal curriculum.
Teachers build on prior knowledge and ensure that skills are embedded in order to promote fluency across all the key maths areas.

We aim to:

- Develop fluency with whole numbers- learning to count, read and write numbers where appropriate, using symbols where required.

- Develop understanding of mathematical language (e.g. less/more) and identify using symbols or speech.
- Begin to understand mathematical symbols (+ - =) and apply these appropriately
- Begin sharing and grouping objects, moving on to doubling and recognising simple fractions (half, quarter)
- Begin to compare length and heights, learning language and symbols (big, small, tall, long, short)
- Learn language and symbols linked to mass/weight and capacity/volume (more, less, heavy, light, full, empty)
- Develop knowledge of appropriate measuring tools, using them to measure all of the above
- Develop knowledge of time and chronology by building on the ability to sequence daily events and comment on day, night, quick, slow, first, next, before, after etc.
- Learn the days of the week and months and what may happen on these days (often represented on a class timetable)
- Begin to tell the time (to the hour and half past the hour)
- Recognise coins and begin to understand value
- Develop fluency with recognising and naming 2D and 3D shapes
- Learn language and symbols to describe the position and direction of an object

As learners cross over into formal learning, they will develop a deeper understanding of the above areas, with a greater emphasis on problem solving and the ability to apply Mathematical reasoning when answering questions.

They will also build on prior knowledge by:

- Expanding understanding of number and place value, counting in multiples, comparing and ordering numbers
- Becoming increasingly fluent in the 4 operations (addition, subtraction, multiplication and division)
- Extending knowledge of fractions by recognising, writing and calculating
- Developing a deeper understanding of measure and how to apply these to answer problems by using length, mass, volume and capacity
- Telling the time for meaning using an analogue clock
- Using money to complete calculations
- Becoming increasingly fluent in 2D and 3D shapes and their properties
- Using statistics to interpret and present data using bar charts, pictograms and tables, answering questions about the data presented

If any of our pupils were to work beyond these skills, teachers will refer to the national curriculum document in Maths for the next stages of learning.

Key Stage 4

Semi-formal and formal learners at Newfield begin to work towards accreditation in Maths from Key Stage 4, they have the opportunity to take the Entry 1 Functional Skills Exam by the end of key stage where appropriate.

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Our Key Stage 4 rationale states that:

From this stage adults increasingly become facilitators of learning and the intention is for the students to lead the direction of their learning experiences.

The curriculum offers an increase in emphasis on a personalised timetable of accreditation and option choices based around destination and outcome led planning. The pupils from the ages of 14 to 16 work through a curriculum that is age appropriate and based on consolidating and generalising skills into more adult based, real-life settings, following the principles of preparation for adulthood.

As part of our Maths curriculum, these learners will develop skills required to answer questions at Entry Level. They also develop their ability to apply Mathematical knowledge to more age appropriate scenarios.

Some examples of expectations of our students at Key Stage 4 include:

- Using number practically to solve a range of problems
- Using money in a functional way e.g. by going shopping or running a tuck shop
- Understanding and describing shapes in the environment
- Problem solving using measurement
- Learning how to tell the time and using this functionally
- Understanding and giving instructions including position and direction

Interventions also take place for the students working towards Entry Level Exams who may require additional support.

Assessment

We believe in the importance of immediate, personalised feedback. Most marking is done by Teachers during lessons. Being next to the child and having conversations in the moment about their work has far more impact and is more meaningful for our learners than written feedback that some may struggle to access. Adults create learning environments where this dialogue and feedback is possible, utilising pupil's individual methods of communication.

Formative Assessment	Summative Assessment
On-going: • Teacher and EHCA observation • Evidence for Learning – collection of photographic and written evidence • Discussion and questioning * • Self and peer-assessments * • Written feedback in pupil workbooks*	• BSquared Assessments - Progression Steps • Evidence for learning – RAG ratings against skills framework • Pre-Key Stage Standards (end of Key Stage) • Functional Skill Exams (KS4) *

*where relevant and appropriate

Home Learning and Parental Engagement

If so desired, parents and carers are able to support pupils' learning at home, they are able to do so by accessing RMEasi Maths, an online Maths program designed for students. This can be used both

in school and at home. We are also able to offer activities via Twinkl Go, including games, matching and other online challenges.

Maths progression is shared with home via our Evidence for Learning program on a termly basis, with photographs and written comments regarding pupil progress. This information is also shared via parent consultation meetings and annual reviews.

Reference List

National Curriculum in England: mathematics programmes of study - https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study

Early years foundation stage (EYFS) statutory framework - https://www.gov.uk/government/publications/early-years-foundation-stage-framework--2