Teaching for Mastery in Maths at Northleaze C of E Primary School

At Northleaze, we firmly believe that maths is for everyone and that no child should be allowed to think that they 'can't do maths'. All pupils are entitled to access the essential set of rich mathematical concepts and big ideas that will allow them to flourish and become successful and numerate adults. We understand that learning maths is like building a tower; children must have firm foundations and acquire specific building blocks in a certain order. If any of these blocks of understanding are missing (due to too-rapid acceleration or insufficient depth), then the tower is shaky and can be toppled at any time.

This approach to the teaching of Maths at Northleaze is now embedded and we continue to refine and adapt our approach so that all our pupils know that they 'can do' maths!

The Curriculum at Northleaze:

At Northleaze we follow the National Curriculum for mathematics, supported by the White Rose Maths Scheme, NCETM and the Boolean Maths Hub. We aim to deliver an inspiring and engaging mathematics curriculum, enabling the children to be numerate, creative, independent, inquisitive, and confident.

Alongside developing children's fluency in arithmetic skills, the new curriculum requires children to be able to reason mathematically. At Northleaze, we provide opportunities for children to apply their skills and understanding to everyday contexts in a variety of lessons. Children are encouraged to enquire and explore their understanding through investigations and open-ended problems. We encourage our children to talk mathematically and they are always asked to explain their answer.

This mastery approach to the National Curriculum for maths ensures the children spend a sufficient length of time on each unit so that they are secure in *using and applying* their new skills before moving on to tackle new concepts. Mastery of mathematics is not a fixed state but a continuum.

Key features of mastery maths lessons at Northleaze:

- Split lessons (using the *hinge* question) to enable 'same day intervention' and provide valuable support if and when needed
- All children experience CPA (concrete, pictorial and abstract) when learning new concepts and consolidating knowledge and skills – *see CPA section below for further explanation*
- Whole class 'ping pong' style teaching – many opportunities for children to 'do' maths, explore concepts, prove ideas by engaging in short, structured tasks, that will provide opportunities to apply and deepen their conceptual understanding
- Rapid, same or next day intervention to ensure children 'keep up' and secure skills before moving on
- Same content for all learners in line with the National Curriculum's expectation that the 'majority of pupils will move through the programmes of study at broadly the same pace'. *This will be the case unless children are working significantly below age-related expectations.*
- Through self-marking and teacher assessment children will take responsibility for and play an active role in their own learning

Sam Withinshaw – Maths Subject Leader. January 2022

- The opportunity for 'rapid graspers' to access 'Dong Nao Jin' (Use Your Head!) challenges in order to further stretch and deepen their understanding. *Children will not be accelerated to the next year group's concepts.*

Concrete, pictorial and abstract (CPA):

The learning of new concepts in maths is supported by the use of '**concrete** manipulatives' such as tens frames, number beads, number lines, Numicon, Dienes and place value counters designed to enhance children's visual and kinaesthetic understanding. As their conceptual understanding develops they move towards the **pictorial** representation of the learning (for example, bar model, number lines) and finally progress towards the **abstract** numeral and symbols.

Professional development for all staff:

We are working closely with the Lighthouse Schools Partnership, St Peter's Teaching School in Portishead and the Boolean Maths Hub to support our work in developing teaching staff subject knowledge and expertise in this area. Key concepts we are working hard to embed throughout our school are listed below:

Teaching for Mastery

MathsHUBS Boolean

- Devoting more time to introduction of key concepts
- Focusing on one key idea only per lesson
- Keeping the whole class together
- Concentrating on pupils' thinking (as well as doing)
- Anticipating difficult points and misconceptions
- Choosing representations and models carefully
- Planning questioning carefully
- Expecting and supporting precise explanations and reasoning from pupils
- Applying variation theory (definition to follow)
- Intervening quickly to support those falling behind

The Essence of Maths Teaching for Mastery, NCETM

'Ask why.
Ask how.
Ask whether it makes sense
Ask what if.
Ask what if not.'
C.Danielson