

Carlton Junior & Infant School

Maths Policy

September 2019



Introduction

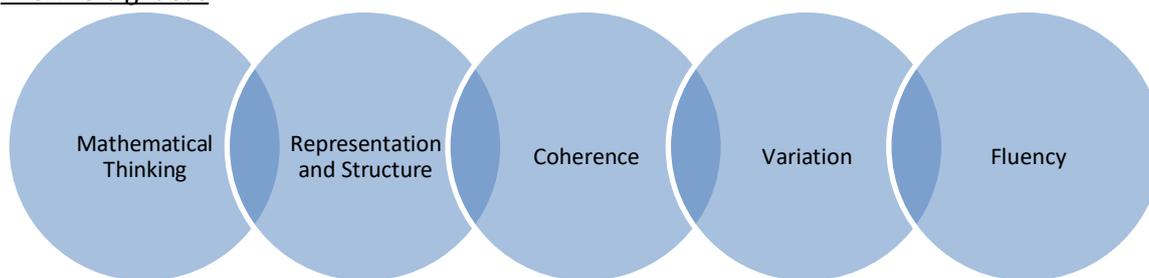
In September 2018, Carlton began transitioning towards a mastery approach to the teaching and learning of mathematics. The rationale behind changing our approach to teaching mathematics lay within the research of Guskey (2009) and Skemp (1976), the Mathematics Specialist Teacher Programme, the NCETM/Maths Hub led Mastery Specialist Programme as well as the 2014 National Curriculum, which states:

The expectation is that most pupils will move through the programmes of study at broadly the same pace. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.

Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas. Opportunities for Mathematical Thinking allow children to make chains of reasoning connected with the other areas of their mathematics. A focus on Representation and Structure ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns as well as specialise and generalise whilst problem solving. Coherence is achieved through the planning of small connected steps to link every question and lesson within a topic. Teachers use both procedural and conceptual Variation within their lessons and there remains an emphasis on Fluency with a relentless focus on number and times table facts.

The five big ideas



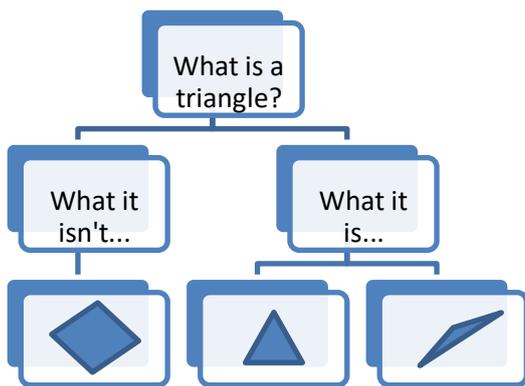
Rationale

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is important in everyday life. It is integral to all aspects of life and we endeavor to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them.

It is vital that a positive attitude towards mathematics is encouraged amongst all our pupils to foster confidence and achievement in a skill that is essential in our society. At Carlton, we use the new National Curriculum for Mathematics (2014) as the basis of our mathematics programme. We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education. Assessment for Learning, an emphasis on investigation, problem solving and the development of mathematical thinking and a rigorous approach to the development of teacher subject knowledge are therefore essential components of the Carlton approach to this subject.

Teaching Principles

1. believe in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations.
2. The whole class is taught mathematics together, with no differentiation by acceleration to new content. *We do not group children by ability.* The learning needs of individuals are addressed through careful scaffolding, questioning and appropriate rapid intervention where necessary, to provide the appropriate support and challenge.
3. The reasoning behind mathematical processes is emphasized. Teacher/pupil interaction explores *how* answers were obtained as well as *why* the method worked and what might be the most efficient strategy.
4. Precise mathematical language, often couched in full sentences, is used by teachers so that mathematical ideas are conveyed with clarity and precision.
5. We value 'mathematical talk' and children get lots of opportunity to talk about and evaluate their mathematics during lessons.
6. *Conceptual variation* and *procedural variation* are used extensively throughout teaching. This helps to present the mathematics in ways that promote deep, sustainable learning.
 - a. Conceptual variation is where the concept is varied and there is intelligent practice. Positive variation is showing what the concept is, and negative variation is showing what the concept isn't. This clears away misconceptions at the very start. Within positive variation, both standard and nonstandard representations are shown.



- b. Procedural variation is where different procedures and/or representations are used to bring about understanding. For example, teachers may collect several solutions for a problem (some right, some wrong) before guiding the class towards the most efficient method. It also involves highlighting the essential features of a concept or idea through varying the non-essential features. Variation is not the same as variety – careful attention needs to be paid to what aspects are being varied (and what is not being varied) and for what purpose.

7. Sufficient time is spent on key concepts to ensure learning is well developed and deeply embedded before moving on.

Features of Lesson Design

1. Lessons are short but intense; teacher input usually lasts around 30 minutes giving ample time for independent practice whilst the teacher delivers *rapid intervention* should somebody require it. Independent practice includes reasoning, problem solving and higher-order thinking activities.
2. Lessons are sharply focused with one new objective introduced at a time.

3. Difficult points and potential misconceptions are identified in advance and strategies to address them planned. Key questions are planned, to challenge thinking and develop learning for all pupils.
4. The use of high quality materials (Inspire textbooks) and tasks (NRICH, NCETM Mastery Assessment materials) to support learning and provide access to the mathematics is integrated into lessons.
5. There is regular interchange between concrete/contextual ideas and their abstract/symbolic representation.
6. Making comparisons is an important form of developing deep knowledge. The questions “*What’s the same, what’s different?*” are often used to draw attention to essential features of concepts.
7. Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities. Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils’ knowledge and understanding and adjusts the lesson accordingly. This forms part of the mastery learning instructional process.



Classroom Norms to Establish

1. Everyone can learn mathematics to the highest levels.
2. If you ‘can’t do it’, you ‘can’t do it **yet**’.
3. Mistakes are valuable.
4. Questions are important.
5. Mathematics is about creativity and problem solving.
6. Mathematics is about making connections and communicating what we think.
7. Depth is much more important than speed.
8. Maths lessons are about learning, not performing.

Assessment

Formative Assessment

We use ‘Assertive Mentoring’ materials to support rigorous and regular formative assessment of basic skills in numeracy. Pupils sit a weekly ‘Maths Challenge’, the results of which are analysed to identify key gaps in understanding which are providing a barrier to progress. These gaps are then addressed in class. Such tasks, as well as questions taken from the White Rose Maths Hub planning and NCETM Mastery Assessment Materials, help triangulate our teacher judgments alongside work in books at the end of each term.

Summative Assessment

Using WR termly tests, pupils are assessed against their year group objectives every term. Target Tracker is updated half termly. National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments.

The school’s Assessment and Marking Policies inform high quality feedback and pupils’ response to it in Mathematics.

EYFS

We follow EYFS curriculum guidance for Mathematics. However, we are committed to ensuring the confident development of number sense and put emphasis on mastery of key early concepts. Pupils explore the ‘story’ of

numbers to twenty and the development of models and images for numbers as a solid foundation for further progress. Teachers use the 'Singapore Maths' concrete – pictorial – abstract approach to conceptual development.

Resources

A bank of essential mathematics resources are kept in each classroom. Further resources relating to key whole school topics for example 'Fractions' are kept in the fish bowl cupboard. Teacher's reference books and research documents are kept in the teachers' shared drive.

Information and Communication Technology

ICT is used in various ways to support teaching and motivate children's learning. Each classroom has a PC connected to an interactive whiteboard and a 'visualiser'. All teachers are provided with a laptop and an I-pad to support their planning and provision and are encouraged to use ICT to enhance teaching and learning in mathematics where appropriate.

Role of the Subject Leader

- Ensures teachers understand the requirements of the National Curriculum and supports them to plan lessons. Leads by example by setting high standards in their own teaching.
- Leads continuing professional development and learning (CPDL); facilitates joint professional development – especially Lesson Study; provides coaching and feedback for teachers to improve pupil learning.
- Leads the whole-school monitoring and evaluation of teaching and learning in mathematics by: observing teaching and learning in maths regularly; analyzing assessment data in order to plan whole school improvement in mathematics; conducting work scrutiny to inform evaluation of progress; conducting pupil interviews and reports to the Headteacher.
- Takes responsibility for managing own professional development by participating in external training, independent private study, engagement in educational research and scholarly reading.
- Keeps parents informed about mathematics issues.
- Ensures that the school's senior leaders and governors are kept informed about the quality of teaching and learning in mathematics.
- Works in close partnership with the school's SENDCo to ensure the learning needs of all pupils in mathematics are met effectively.
- Keeps the school's policy for mathematics under regular review.

Shared agreed with staff	September 2019
Shared with Children and Parents	September 2019
Ratified by Governors	September 2019
Review date	September 2022