



The  
Boleyn  
Trust

# Mathematics policy

Policy Creation and Review	
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## **The three 1s (intent, implementation and impact)**

### **Purpose (Intent)**

"To create a generation who have no fear of numbers!"

At New City we aim to make our curriculum creative and help develop our children's understanding and curiosity of the mathematical world which surrounds them. Our maths curriculum will provide our pupils with everyday life skills to help enable them to successfully solve problems mentally and using written forms. Our rich, varied and exciting lessons will intellectually challenge the pupils, help them progress and develop their understanding how maths will impact their lives today, tomorrow and in the future.

### **Aim (implementation)**

The aim of our maths curriculum is to ensure that all pupils:

- 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.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

### **Outcomes (impact)**

Children are engaged in their learning and eager to widen their understanding and apply their skills; they are able to see connections between the skills learn in class and their apply those skills to real life experiences. Our pupils will be able to solve and explain mathematical problems using concrete materials, pictorials and abstract methods. When discussing their own work, it is important that the children can explain about their methods used and understand how it can be applied to real life situations.

### Teaching and learning - The Singapore approach

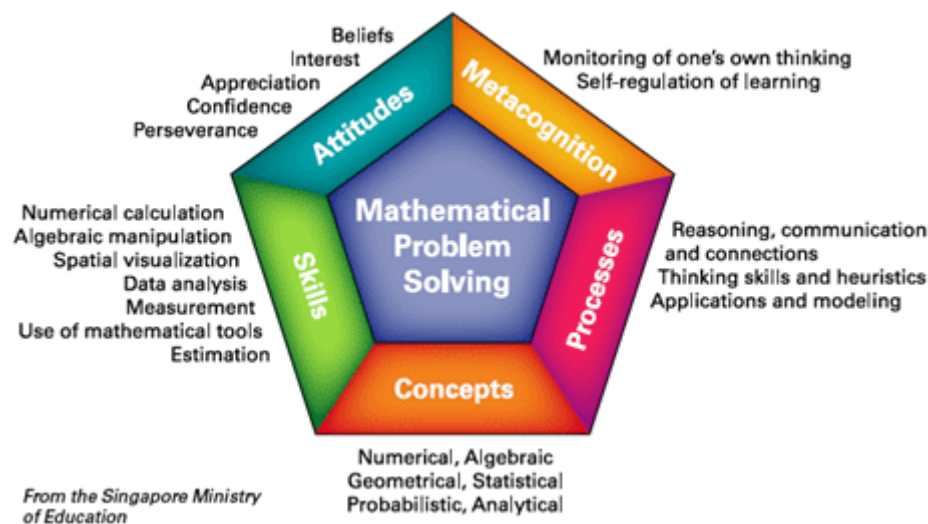
Good teaching in mathematics provides children with a balance between repetition and practice, new learning and the application of ongoing learning with appropriate challenge and high expectation. The New Mastery Curriculum encompasses the need to embed key skills as well as promote and develop greater depth of learning.

The mathematics curriculum content should be organised in ways that emphasise the connection between mathematical ideas. It should enable children to recognise how their learning fits together within the four operations, rather than appearing fragmented. The challenge for teachers in planning and learning for children is to provide the interlinked 'bigger picture' and connections which is then broken down into manageable chunks for all learners to access.

At New City, we have adopted elements of the Singapore methods of teaching in order to embed the fundamental mathematical skills we want our Learners to achieve. The Concrete-Pictorial-Abstract (CPA) approach supports such learning, alongside embedding key skills required to achieve a mathematics mastery curriculum.

New City have adopted the five key principles of The Singapore Mathematics Framework (Metacognition; Processes; Concepts; Skills; Attitudes) to underpin and promote core values that are believed to encourage, enable and enhance student learning whilst ultimately developing mathematical problem solving for everyday real life contexts.

### Singapore's Mathematics Framework



### Key approaches to learning:

Learning is about making connections:

- The spiral curriculum (curriculum approach) - connecting to extend existing knowledge and skills

- The Concrete-Pictorial-Abstract (C-P-A) development of concept (pedagogical approach) that connect to make sense of learning
- The key ingredients to each maths lesson at New City is to have problem solving, reasoning and fluency (refer to the national curriculum)

### **Maths Mastery Teaching Timeline and Approach:**

Our Maths lessons adopt a four part structure of:

- Anchor (Hook - opportunity for exploration)
- Guidance (Main teaching where teacher models examples)
- Independent (Students have the opportunity to practice examples themselves independently)
- Reflection and explanation and reasoning (opportunity to review learning and misconceptions - plenaries, mini-plenaries)

A heavy emphasis is placed on the C-P-A approach. Research in Learning from key theorists\* in education is heavily referred to in promoting students positive attribute to learning. The following are fundamental in ensuring that such key aspects are being delivered daily in the classroom:

- Opportunities for students to interact with their peers (Vygotsky)
- Concrete activities
- Exploration (Piaget)
- Safety of learning environment (Promoting 'productive failure' learning from mistakes)

(\*Dienes, Bruner, Vygotsky, Skemp, Piaget)

We want pupils at New City to become independent mathematical learners who are encouraged to reason and explain their learning. Such skills can be reinforced, embedded and developed further in order to be used and applied in different contexts.

### **Maths planning:**

The duration of a Mathematics lesson at New City is approximately 1 hour. They follow a generic format

#### **Planning:**

The curriculum overview is organised within the four operations of number (Numerical reasoning; Additive reasoning; Multiplicative reasoning and Geometric reasoning). These skills are to be taught over a 3 to 4 week block with frequent opportunities to use and apply within varying contexts such as measure and statistics.

**Long term and Medium term planning in Mathematics:** is based on the New City Whole School overview in Mathematics. The concepts to be taught and covered are listed accordingly. Teachers, need to ensure these are broken down into child friendly objectives that are seen to be progressive in its learning journey over the week.

**Short term planning:** is carried out on a weekly basis. All planning includes a skill based learning objective with succinct success criteria, a hook, a progressive teaching sequence, Key AFL strategies, key questioning, relevant vocabulary and resources, mastery and explanation and reasoning.

**Short term planning** is collected and monitored by the maths leader and SLT.

## Key learning documentation in mathematics

These are the key documents that we will be using when planning mathematics:

- New Maths Curriculum
- Maths Overviews
- Maths No Problem
- Maths on target.
- New City Primary calculation policy
- Test Base
- Maths Hub Mastery Overviews/White Rose Hub

## Timestables

Children are tested on timestables as part of earning achievement badges that are given out in assemblies. Children practice at home and at school are tested during timetabled slots. To earn each badge they must:

*Bronze: Learn their 1, 2, 3, 5 and 10 in order*

*Silver: Learn their 4, 6, 7, 8, 11 and 12 in order*

*Gold: Learn all their timestables to 12x12 in any order, with the division facts*

*Diamond: Learn a variety of mathematical facts, such as: square routes, prime numbers, square and cube numbers and divisibility rules.*

We are also a subscriber of TTRockstars and this is a tool used to monitor children's progress and set homework for the pupils in year 2 - 6.

## Display

We recognise the important role display has in the teaching and learning of mathematics by having maths work displayed in the school. Every class has a mathematics board, where possible in the main teaching area, which has number lines (relevant to the work the children are doing), number grids, vocabulary and other display materials that provide a visual support for the children's mental processes.

## Assessment and Record Keeping

At New City we are continually assessing our pupils and recording their progress. We see assessment as an integral part of the teaching process and aim to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress. Assessment is carried out on three levels.

Short-term assessments are an informal part of every lesson and are closely matched to the teaching objectives. These tend not to be recorded because they are for the teacher's immediate attention and action; however, pertinent comments are occasionally recorded on the reverse of the short-term planning sheets.

Medium term and long term assessments are carried out termly. The purpose of these assessments is to review and record the progress the pupils have made, measured against school and national targets. This is done by drawing on class records of Key Objectives and any supplementary notes that have been made and where applicable Puma

tests and testbase subject packs carried out during assessment week periods. All data is analysed by senior management, the maths leader and the Inclusion team.

All parents receive an annual written report on which there is a summary of their child's effort and progress in mathematics over the year. In addition to this, parents will also receive a termly report card which provides information on the child's current level, the progress grade and the effort grade.

At the end of Key Stage 1 and Key Stage 2 each pupil's level of achievement against national standards is included as part of their annual written report.

### **Resources**

Resources for the delivery of the maths curriculum are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic-specific items are stored centrally.

New City School uses a variety of published materials to facilitate the teaching of mathematics but recognises the need for the teaching of maths to 'scheme assisted not scheme driven.' Materials are constantly updated, as new and relevant items become available. The maths post holder orders new resources after consultation with the staff.

All KS1 and KS2 classrooms should keep a ready supply of support materials for the children to use in each lesson. Number lines and Number squares, where necessary should be displayed in each classroom.

### **Equal opportunities and SEND**

As a staff we endeavour to maintain an awareness of, and to provide for equal opportunities for all our pupils in mathematics. We aim to take into account cultural background, gender and Special Needs, both in our teaching attitudes and in the published materials we use with our pupils.

Wherever possible we aim to fully include SEN pupils in the daily mathematics lesson so that they benefit from the emphasis on oral and mental work and by listening and participating with other children in demonstrating and explaining their methods.

Where necessary teachers will, in consultation with the Inclusion leader set manageable mathematical termly targets. If a child's needs are particularly severe they will work on an individualised programme written in consultation with the appropriate staff. When planning teachers will try to address the child's needs through simplified or modified tasks or the use of support staff.

### **Homework**

Children are given mathematics homework twice a week. The first being a set times tables to learn in preparation for timestable badge testing, the second homework is set through Mathletics, which is an online platform for the children to practice the skills they have learnt at school. The amount of homework set is about 20 minutes in both key stages. All homework is written work, which needs marking and we encourage teachers to set work, which makes use of the home context.

### **Role of Subject Leader:**

The Subject Leader should be responsible for improving the standards of teaching and learning in maths through:

- Monitoring and evaluating pupil progress;
- Provision of maths
- The quality of the Learning Environment;
- Taking the lead in policy development;
- Auditing and supporting colleagues in their CPD;
- Purchasing and organising resources;
- Keeping up to dates with changes in the subject

### New City Maths Teaching Timeline (Reception and KS1)

<b>Intro 20 Mins</b>	Introducing L.O and Success criteria/responding to marking	<p>AFL Strategies Used Throughout</p> <p>(possible exit points for key groups, independent or with TA support)</p>
	<u>In Focus /Hook</u> - Paired or solo work on whiteboards using resources. Explanation and reasoning questions.	
	<u>Let's learn/Modelling</u> Discussing In Focus activity with children before direct teaching of new learning and Modelling (T1 active participation with pupils)	
	Set out expectation for end of the session	
<b>Main activity 30 mins</b>	At least 30 minutes focused activity children are independent. The teacher continues to teach through focused groups. Explanation, reasoning and problem solving opportunities for all ability groups	<p>AFL Strategies used throughout</p>
	Mini- Plenary used within independent learning time to : make connections /address misconceptions & refine/ rehearse	
<b>Plenary 10 mins</b>	Address success criteria and learning within groups- who has achieved?	<p>AFL Strategies used throughout</p>
	Demonstrate depth when appropriate using application questions, children evaluate their learning (orally or in books)	
	Teacher evaluation next step-Where do we go from here?	

### New City Maths Teaching Timeline (KS2)

<b>Intro 20 Mins</b>	Introduce L.O and SC Quick maths Y3-6 (fluency/recall)	<p>AFL Strategies Used Throughout</p> <p>(possible exit points for key groups, independent or with TA support)</p>
	<u>In Focus /Hook</u> - Paired or solo work on whiteboards using resources. Explanation and reasoning questions extensions.	
	<u>Let's learn/Modelling</u> Taking on children's strategies before direct teaching of new learning and Modelling (TA active participation with pupils)	
	<u>Guided practice</u> Varied tasks with pictorial or concrete support completed in book	

<b>Main activity 30 mins</b>	At least 30 minutes focused activity children are independent. The teacher continues to teach through focused groups and intervention mark. Explanation, reasoning and problem solving opportunities for all ability groups	AFL Strategies used throughout
	Mini- Plenary used within learning time to : make connections /address misconceptions & refine/ rehearse	

<b>Plenary 10 mins</b>	Address learning within groups- who has achieved? Self/peer marking	AFL Strategies used throughout
	Demonstrate depth when appropriate using application questions, children evaluate their learning, explain or reason.	
	Teacher evaluation next step-Where do we go from here?	



