Harry Gosling Primary School
Mathematics Policy
November 2018

This policy outlines the teaching, organisation and management of the mathematics taught and learnt at Harry Gosling Primary school. The school's policy for mathematics is based on the National Curriculum for teaching mathematics from Year 1 to Year 6. The implementation of this policy is the responsibility of all the teaching staff.

> ## Maths Vision
> **Our aim at Harry Gosling is to develop fluent, articulate mathematicians who are confident in drawing on a range of strategies to solve Maths problems.**

Planning
- **EYFS** teachers plan according to the EYFS mathematics goals
- **Year 1, 2, 3 and 4** staff use the Maths No Problem textbooks and workbooks
- Teachers in **Years 5 and 6** plan using the White Rose scheme of work, to ensure coverage of National Curriculum objectives

Teachers use the relevant planning formats for their year groups.

Teachers use the methods detailed in the school's calculation policy.

Teaching

- **EYFS** teachers teach use EYFS pedagogy. The materials have a strong focus on counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures. All the children are given the opportunity to talk and communicate in a widening range of situations and to practise and extend their vocabulary and numeracy skills. Children are given many opportunities to develop understanding of number, measures, patterns, shape and space, through varied activities that allow them to enjoy, explore and use mathematics in a range of situations. Mathematics is taught both as a discrete subject and within the whole Early Years Curriculum to give children opportunities to use their maths skills in real life situations
- **Year 1 - 4** staff use the Singapore maths lesson structures and pedagogy
- Teachers in **Years 5 and 6** use the 'Maths Lessons at Harry Gosling' document to inform their teaching. This document details what should be included in each maths lesson

There is no prescribed structure for maths lessons at Harry Gosling.

Teachers have access to a comprehensive glossary to fill any gaps in subject knowledge.

Marking

Teachers follow the school's marking policy – marking in detail once a week, providing 'fix-it' time for the children and using self and peer assessment on a weekly basis.

Assessment

We use a combination of PUMA and Maths No Problem maths assessments to assess children 4 times throughout the year: Autumn 1, Autumn 2, at the end of the Spring term and at the end of the Summer term.

Teachers mark tests and complete the diagnostic spreadsheet for their year group so that a whole school view of pupils' strengths and weaknesses can be obtained.

Homework

Children should be set weekly Maths homework based on what they have covered in class.

Working walls/Maths displays

Teachers should maintain a maths working wall/maths display. This should include:

- Written methods from the calculation policy
- Word problems and bar modelling
- The times tables poster (Y2 to Y6)
- The operations language posters
- Language for different word problems
- The TH language structures poster for maths
- A display of common units of measurement and their equivalents

Maths Lessons at Harry Gosling (2018-19)

The purpose of this document is to provide guidance about what to include in maths lessons.

There is no prescribed structure for a maths lesson at Harry Gosling. Teachers should use their professional judgement to plan and structure lessons to suit the needs of their class and the requirements of the curriculum.

However, in order to embed recent training and best practice across the school, there are expectations about what we should include in maths lessons. The following list makes up the maths lesson 'Non-negotiables' and should be evident in each maths lesson, unless otherwise stated.

Counting
Daily counting as a class is essential in developing children's mathematical fluency. Teachers should use their unit overviews or year group expectations documents to decide the intervals in which to count.

Concrete Resources
At Harry Gosling, we follow the 'Concrete, Pictorial, Abstract (CPA)' approach to maths teaching and learning. Based on Jerome Bruner's research, the approach states that children should be introduced to a new idea or skill by first acting it out with real objects, then relating them to pictures or diagrams, before moving on to abstract mathematical notation.

To ensure consistency across the school, the following concrete resources have been provided for each year group:

Years 1 and 2: Base 10 Dienes blocks
Years 3, 4 , 5 and 6: Place value counters and base 10 Dienes blocks

These resources should be used for number work and should always be available on tables for those children who require them.

When these resources do not lend themselves to certain topics, such as fractions or time, other concrete resources should be used, such as paper rectangles or model clocks.

'Anchor tasks'
Wherever possible teachers should give children an opportunity to explore new topics through anchor tasks – activities where children respond to an engaging and challenging question by exploring and manipulating concrete objects. Such activities support learning by giving children an opportunity to wrestle with problems and find things out for themselves, setting the scene for subsequent structured discussion and formal learning situations.

Consistent Visual models

- **Visual representations of concrete resources**
  To consolidate the use of these concrete resources, teachers should use these online tools for flipcharts and whole class demonstrations:
  Dienes blocks: http://www.mathlearningcenter.org/web-apps/number-pieces/
  Place value counters: Please use the flipchart template located in the maths folder.

- **Bar modelling**

Bar modelling 'supports the transformation of real life problems into a mathematical form and can bridge the gap between concrete mathematical experiences and abstract representations' (NCETM, 2014). It is expected that teachers use bar modelling whenever they are working through a number problem as a class and encourage children to draw out bars to help understand what is required in a maths problem.

To ensure consistency across the school, please see the supplementary bar modelling guide for support in representing various types of problems.

Consistent calculation methods

Teachers should teach the calculation methods for their year groups detailed in the school's Calculation Policy. Calculation methods should be displayed on working walls and should be regularly revisited and consolidated in mastery sessions.

Problem solving

This is one of the three strands of the National Curriculum for Maths and **should be incorporated into every maths lesson**. Teachers should introduce new concepts through a problem solving approach, similar to the 'Anchor Tasks' of Singapore maths. The 'Maths No Problem' textbooks can be used for support when planning these activities. At tables, children should apply their maths knowledge to varied problems, rather than complete lists of calculations. This 'Intelligent Practice' is more likely to develop confident mathematicians.

Intelligent practice

Intelligent practice aims to develop conceptual understanding and procedural fluency in parallel. It involves providing varied tasks to children so that they can develop relational understanding, rather than simply learn how to follow a process. Long lists of calculations are to be avoided as tasks and teachers should use the following resources for support in planning activities which provide 'intelligent practice' for that lesson's learning intention:

- Testbase problems
- 'Maths No problem' textbooks
- Inverse and missing number calculations
- NRich (http://nrich.maths.org)

Reasoning

In addition to fluency and problem solving, reasoning is the final strand of the National Curriculum and needs to be given lots of attention in class, as it is a skill which children often find difficult to master. It is expected that teachers **dedicate two plenaries a week to reasoning** and use questioning and 'fix-it time' tasks to provide further opportunities for children to develop their reasoning skills. Testbase provides a number of reasoning tasks that can be used and adapted by teachers.

Differentiation

With regard to differentiation, the National Curriculum states that 'the expectation is that the majority of 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.'

Differentiation for lower attainers should be through resources provided and **should not be through providing simpler numbers or tasks**. Less confident children will be more reliant on the concrete resources provided for tasks and should use those to consolidate their understanding.

Higher attainers **should not be moved on to new content before the rest of the class**, but instead should be provided with challenging problems using the content taught, such as multiple step word problems, inverse calculations or open-ended investigative tasks. The Maths No Problem textbooks and workbooks, Testbase, the NCETM assessment materials and the LBTH assessment materials can all be used for support in planning these extension tasks.

Online Resources to support Teaching for Mastery In Maths

A number of video resources are available online to support Teaching for Mastery:

- The Maths No Problem website: https://mathsnoproblem.com/ (teacher log-in required)
- NCETM suite of videos to support the teaching of the Maths National Curriculum: https://www.ncetm.org.uk/resources/40529 **OR** https://www.youtube.com/user/NCETM **OR** https://vimeo.com/ncetm

There are also links in the Calculation Policy showing how to develop conceptual understanding of various methods.