Policy for Mathematics

INTRODUCTION

This document is a statement of the aims, principles and strategies for the teaching and learning of Mathematics. It has been developed through a process of consultation between teaching staff and is periodically reviewed.

We actively promote democracy, the rule of the law, individual liberty, and respect those with different faiths and beliefs. These are fundamental British Values which underpin all that we offer, as does our School Motto 'Not for oneself but for all.

WHAT IS MATHEMATICS?

Mathematics is a body of knowledge which equips children to interpret everyday life. It provides a precise and universal means of communication, using numbers, symbols and shapes, and is used to explain, represent and predict real-life events and problems.

AIMS OF TEACHING MATHEMATICS

- To develop the practical skills and understanding of concepts, facts and operations as outlined in the 2014 Primary Mathematics Curriculum and in the Renewed Primary Maths Framework. The Common Entrance examination for entry to independent secondary boarding schools, and the in-house entrance exams set by independent secondary day schools are in line with this, being set at Level 4/5 of the National Curriculum, with more able pupils aiming to achieve Level 6.
- To engender a positive, confident and independent approach to Maths.
- To help children discover the patterns and relationships which are the essence of the subject, and enable them to develop an appreciation of the beauty and elegance of these patterns.
- To familiarise children with a variety of equipment (including measuring devices, calculators and computers) so that they can use them effectively in a variety of situations.
- To help children develop a wide variety of mental arithmetic skills and flexible strategies for handling numbers, through a CPA approach to understanding.
- To engender both independent and co-operative modes of work, and the selection of appropriate resources for a task.
- To develop good work habits: persistence, commitment and a systematic approach.
- To nurture the initiative and imagination needed to tackle problems and investigations by reasoning, trial and improvement and the making and testing of hypotheses.
- To ensure that every child is given equal opportunity to develop his/her full potential by the provision of appropriate learning situations, and to value the contributions of each child.

ORGANISATION AND DIFFERENTIATION

Mathematics is organised on a subject basis outside other topic frameworks (although there are often cross-curricular links, particularly at Pre-Prep). At Pre-Prep and Prep each class receives 4 hours 40 minutes of Maths teaching per week. In Prep this includes a weekly 40-minute Non-Verbal Reasoning/problem-solving lesson.

In Pre-Prep, Year 1 Maths is taught in class groups by the Class Teacher, with the help of a Classroom Assistant. Differentiation is achieved by grouping within the class and the choice of appropriate resources and tasks. In Year 2 the children are set in ability groups across the year group.

In Prep, Maths is taught by specialist teachers, the children being grouped by mathematical ability. There are usually two teaching groups, although if the year group is large this may rise to 3 ability groups. Within each year the teachers liaise closely to ensure concurrent coverage of the curriculum. The composition of groups is regularly reviewed to ensure maximum attention to each child's needs. Differentiation takes place within these groups. A small number of children receive extra learning support within school for Maths. Pupils with learning difficulties may also be supported within the classroom environment by the Learning Support staff.

Pupils achieving Standardised Assessment Scores consistently at 130 or above, for at least one academic year, are placed on the More Able, Gifted, Talented and Passionate register. Higher Attaining Pupils are provided, within the daily mathematics lesson, with opportunities to extend their thinking and broaden their experience through problem solving activities and greater depth materials linked to lesson objectives. The pupils are encouraged to express their thinking through oral and written language and algebraic expression where appropriate.

Pupils who are MGTP in Mathematics are likely to:

- learn and understand mathematical ideas quickly;
- work systematically and accurately;
- be more analytical;
- think logically and see mathematical relationships;
- make connections between the concepts they have learned;
- identify patterns easily;
- apply their knowledge to new or unfamiliar contexts;
- communicate their reasoning and justify their methods;
- ask questions that show clear understanding of, and curiosity about, mathematics;
- take a creative approach to solving mathematical problems;
- sustain their concentration throughout longer tasks and persist in seeking solutions;
- be more adept at posing their own questions and pursuing lines of enquiry.
- recognise and solve problem represented in many variations.

TEACHING STRATEGIES AND PUPIL GROUPINGS

It is necessary for most children's effective understanding of Mathematics that they become familiar with the concrete before progressing through pictorial and subsequently the abstract formula. Therefore, great importance is placed on practical work and new concepts will be introduced using concrete representations wherever appropriate.

Mathematics is approached through a process of investigation and then consolidation. The range of teaching styles includes:

- the use of concrete and manipulative resources
- exposition by the teacher
- investigation and problem-solving/practical work
- mathematical discussion
- practice and consolidation
- mental and oral Maths

During any unit of work children will experience a variety of task requiring them to work:

- as individuals
- in pairs or small groups
- as a whole group

We aim to achieve a balance between these approaches.

Calculators are introduced for some tasks in Year 3, and used more as the children progress through Prep. They are used to reinforce number concepts and, in some cases, to enable children to work on investigations without the need to focus on calculation. (They are not a substitute for the mental or written calculation which is appropriate to a child's level). Computer-aided learning is used increasingly. All pupils have access to Mathletics.

At all stages emphasis is placed on the use of correct mathematical language, as an essential to logical and concise communication. The children are taught mathematically sound notation, whilst at the same time being encouraged to develop their own strategies for problem-solving and recording.

The regular re-visiting of topics already covered is vital for the reinforcement of concepts. This is achieved by revision tasks, oral/mental work and linked cross-topic work.

Regular weekly Homework is used to support Mathematics:

- Year 1: 1 x written homework activity and 1 x online activity.
- Year 2: 1 x times table activity and 1 x Mental Arithmetic Task and 1 x online activity.
- Year 3: 1 x 30-minute homework and 1 x Mental Arithmetic Task
- Year 4: 1 x 30-minute homework
- Year 5: Autumn 1 x 40-minute homework. Spring and Summer 2 x 40-minute homework periods.
- Year 6: 2 x 45-minute homework periods (in the Spring and Summer 1 x 45 minute homework)
- Times Tables need to be practiced regularly by children in Y2-Y6.

STRATEGIES FOR ENSURING PROGRESS AND CONTINUITY

A Scheme of Work to implement the Mathematics Policy has been developed by the Head of Mathematics in collaboration with all who teach Mathematics. It is based on the 2014 Primary Mathematics Curriculum.

Meetings are used to discuss the curriculum and its implementation, and to ensure consistency of approach and standards.

Collaboration between the Learning Support Department and Maths teaching staff aids and supports pupil progress.

Reviews are monitored by the Senior Leadership Team.

NON-VERBAL REASONING

Pupils at St Hilary's start Non-Verbal Reasoning lessons in Year 4 and continue until the Spring term of Year 6, with a timetabled half an hour lesson each week. Non-verbal reasoning is problem-solving based around pictures, diagrams and shapes, rather than words. Unlike verbal reasoning, it is not as reliant on the English language; rather, the questions use drawings, shapes or codes, and pupils need to work out sequences, similarities and differences between these figures or break the code. Non-Verbal Reasoning tests are designed to see how pupils can use critical thinking and logic to solve problems. The questions in a Non-Verbal

Reasoning test are based around mathematical concepts such symmetry, rotation, mirroring, shape, size and direction, and involve diagrams rather than words.

ROLE OF THE HEAD OF MATHEMATICS

- Take the lead in policy development and the production of schemes of work designed to ensure progression and continuity in Mathematics throughout the school.
- Support colleagues in their development of detailed work-plans, implementation of the Curriculum and in assessment and record-keeping.
- Monitor progress in Maths and advise the Headteacher on action needed.
- Take responsibility for the purchase and organization of central mathematics resources.
- Keep up-to-date with developments in mathematics education and disseminate this information to colleagues.

FEEDBACK TO PUPILS

This is achieved through discussion and the marking of work. The guidelines laid down in the school Marking, Assessment and Recording Policy are followed.

Effective marking:

- aims to be encouraging and supportive
- includes written comments with errors clearly indicated
- is often done while a task is being carried out, through discussion between child and teacher
- may be done by pupils marking their own work

RECORDING AND REPORTING

Assessment Data is recorded for all staff to have access to and help them track pupil progress as well as inform their planning.

Reporting to parents is carried out through parent consultations or a written report, focusing on:

- attitudes to Mathematics
- competence in mathematical skills
- ability to apply mathematical knowledge to new situations

In addition, parents can at any time make an appointment to discuss their child's Maths with the Maths teacher or Head of Mathematics.

ASSESSMENT

Formative assessment is used to guide the progress of individual pupils in Maths.

Classwork, homework, mental arithmetic and tests are regularly marked and the results recorded. In addition, informal assessment is carried on constantly via discussion and observation of the children's mode of working.

Formal summative assessment (for all children in a year-groups) is carried out as follows:

- Termly in-house assessments given at the end of each term.
- PT standardized assessments in October and May to monitor progress and retainment. New pupils entering at the school at Pre-Prep or Prep will be assessed using MALT within a 3-week period following entry, as per Assessment policy.

(Please see Marking, Assessing and Reporting Policy)

RESOURCES

- Pre-Prep: Most resources are kept in classrooms for regular use, including 'Tool kits' x3, at least.
- Pre-prep have Numicon resources to use as necessary.
- Pre-Prep: Some, more specialized resources are centrally-based in the Maths Room, being borrowed and returned as required.
- Prep: Each classroom where Mathematics is taught has a set of 'Tool Kits' for each of the working tables. These contain commonly used resources such as number squares/lines, Dienes, multi-link blocks, counting straws and any other concrete or pictorial resource that that particular class finds useful. The 'Tool Kits' are positioned in the middle of each tables, with the lids removed, for every Mathematics lesson to enable easy access for the children without the need for teacher prompting. Numicon can be 'borrowed' from Pre-Prep when needed.

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Person responsible: Mrs L Brown (Head of Mathematics)