Halton Community Combined School

Mathematics policy

1 Rationale

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of Mathematics and a sense of enjoyment and curiosity about the subject.

1.1 Learning should be a rewarding and enjoyable experience for everyone. We believe that appropriate teaching and learning experiences help prepare children for the next steps in their education and help them to lead happy and rewarding lives.

1.2 At this school, we aim to inspire all children to reach their full academic potential whilst developing an enthusiasm for mathematics. In mathematics, this means ensuring a curriculum that is fully inclusive of all children which:

- develops children's knowledge and understanding of mathematical concepts whilst enabling them to practise and hone skills and methods
- enables them to think critically and communicate their understanding
- gives them opportunities to apply learnt mathematical skills in different contexts across the curriculum
- provides opportunities to develop problem solving skills which are useful for maths and across the curriculum

2 Aims

2.1 We aim to develop pupils' abilities within daily mathematics lessons, and by consolidating and reinforcing skills across the curriculum. Outside the mathematics lesson we also have daily skills sessions to improve speed in mental maths and consolidate basic number knowledge.

2.2 We aim for our pupils to leave Halton with the skills necessary to be creative and successful in their next school:

- calculate with confidence, fluency and understanding, orchestrating a range of independent strategies to self-monitor and correct.
- have a positive attitude towards mathematics and an awareness of the fascination of mathematics.
- solve problems, reason, think logically and work systematically and accurately.
- demonstrate an understanding of mathematics through a process of enquiry and experiment
- develop the powers of imagination, inventiveness and critical awareness.
- have a suitable technical vocabulary to articulate their responses.
- use speaking and listening skills to reason about and discuss mathematics and to understand a range of mathematical problems and simulations
- use computing to support their mathematical understanding and knowledge and their problem solving skills
- learn to communicate and present their findings effectively
- be prepared for applying their skills effectively in everyday life situations, in their future learning and in the workplace

3 Procedure

3.1 Teaching time

To provide adequate time for developing numeracy skills each KS1 and KS2 class teacher will provide a daily mathematics lesson. This may vary in length but will usually last for about 50 to 60 minutes. Wherever possible links will be made to the current topic through other subjects, especially science, geography, DT and PE. This will allow children to begin to use and apply mathematics in real contexts.
Outside the mathematics lesson all children have a daily skills session of about 15 minutes to improve speed in mental maths and consolidate basic number knowledge to further improve standards.
The Reception class has a dedicated mathematics area as well as mathematical opportunities throughout the indoor and outdoor teaching space, to ensure daily exposure to mathematical concepts in their self directed play.

3.2 Class Organisation

A typical lesson

A typical 45 to 60 minute lesson in Year 1 to 6 could be structured like this:

- Oral work and mental calculation (about 5 to 10 minutes)
  This will involve whole-class work to rehearse, sharpen and develop mental and oral skills.
- The main teaching activity (about 30 to 40 minutes)
  This will include both teaching input and pupil activities and a balance between whole class, grouped, paired and individual work.
- A plenary (about 10 to 15 minutes)
  This will involve work with the whole class to sort out misconceptions, identify progress, summarise key facts and ideas and what to remember, as well as to make links to other work and to discuss next steps.

4 Maths Curriculum 2014

4.1 Early Years

The Early Years Foundation Stage outlines the following requirements for mathematics:
Mathematics development involves providing children with opportunities to practise and improve their skills in counting numbers, calculating simple addition and subtraction problems, and to describe shapes, spaces, and measures.

ELG 11 Numbers: Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.
ELG 12 Shape, space and measures: Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

4.2 Key Stages 1 & 2

The programmes of study for mathematics are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage, if appropriate.

4.2.1 Key Stage 1

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

4.2.2 Lower Key Stage 2, (Years 3 and 4)

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

4.2.3 Upper Key Stage 2, (Years 5 and 6)

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

5 Planning and Organisation

Across the school, teachers use the new Programmes of Study to ensure that all parts of the National Curriculum are taught. They may also refer back to the old Primary National Strategy blocks and any other relevant documents to aid their planning.

5 Progression

The new Programmes of Study provide a clear overview of progression throughout the primary curriculum. staff use these and assessment documents such as Assessing Pupil Progress in order to ensure that children progress in their mathematical understanding.

An ability to calculate mentally lies at the heart of numeracy. Therefore, mental methods are emphasised across the school and regular opportunities are provided for children to develop the different skills involved. The school uses 'Teaching Children to Calculate Mentally' in order to ensure children are taught specific strategies and are provided with opportunities to progress.

The balance between mental and written methods and the way in which pupils progress from one to the other, is very important. Our calculation policy clearly shows the progress of each type of calculation.

6 Monitoring and Assessment

Teachers use a range of methods in order to monitor and assess pupil progress, including:

- high quality questioning and discussion during lessons
- working with focus groups of children
- communicating with TAs who have worked with focus groups of children
- quality marking children's books on a regular basis
- having assessment materials in children's books in order to enable self, peer and teacher assessment
- regularly updating assessment documents
- termly summative assessment materials

7 How we cater for pupils who are more able

Where possible more able pupils will be taught with their own class and stretched through differentiated group work and extra challenges. When working with the whole class, teachers will direct questions or challenges towards the more able to maintain their involvement. Very occasionally special arrangements will be made for an exceptionally gifted pupil e.g. they may be taught with children from a higher age range or may follow an individualised programme with more challenging problems to tackle and a focus on applying skills.

8 How we cater for pupils with particular needs

The daily mathematics lesson is appropriate for almost all pupils. Where applicable children's IPMs incorporate suitable objectives from the National Curriculum and teachers keep these objectives in mind when planning work. A pupil whose difficulties are severe or complex may need to be supported with an individualised programme in the main part of the lesson.

Teachers will involve all pupils through differentiation. This will be incorporated into all mathematics lessons and can be done in various ways:

- Stepped Activities which become more difficult and demanding but cater for the less able in the early sections.
- Common Tasks which are open ended activities/investigations where differentiation is by outcome.
- Resourcing which provides a variety of resources depending on abilities e.g. counters, cubes, 100 squares, number lines, mirrors.
- Grouping according to ability so that the groups can be given different tasks when appropriate. Activities are based on the same theme and usually at no more than three levels.
- Guided work when adults work with a group of a similar ability, scaffold their work and address any common errors or misconceptions. Teachers should aim to have a weekly session when this can be used for children to share their learning needs and concerns (wobbly Friday).

9 Resources

Resources are kept in classes, with bulkier, less used items stored centrally. Some items are also stored in the mathematics area of the 5/6 classroom. The school is keen to ensure that teachers are properly resourced and any items needed should be discussed with the co-ordinator and ordered through the office.

10 Cross-curricular opportunities

10.1 Where ever possible lessons will be linked to the class topic to provide a hands on stimulus, purpose and audience for their maths work. We will plan for pupils to practise and apply the skills, knowledge and understanding acquired through lessons to other areas of the curriculum.

10.2 Children are encouraged to use their numeracy skills in their involvement in the life of the school eg budgeting for parties and events, planning layouts for events, planning school grounds improvements, fund raising, ordering resources.

11 Role of subject leader

11.1 The subject leader is responsible for ensuring the quality of provision in maths and assessing its impact on the pupils at Halton. The subject leader will report to the staff and to the head teacher, who will provide senior management support, time or money to undertake necessary, identified developments. The subject leader and the head teacher will report on developments in the subject – and their impact - to Governors, parents and other outside agencies. Teaching staff will access CPD opportunities presented in-house and by the BLT and other providers to ensure practice and principles remain up-to-date and take account of the most recent policy guidance and academic research. The SENCO may be involved in helping teachers tailor and deliver particular aspects of the policy where children exceed or do not meet national expectations in a specific part of the mathematics curriculum.

Responsibility lies with every teacher to deliver the statutory requirements of the maths curriculum.

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

- Termly planning, pupil interviews and work scrutiny
- Encouraging peer observation and whole school discussion of mathematics to ensure progression
- Encouraging staff to identify their training and resource needs
- Formal observations
- Learning walks

12 Parental involvement/Homework

Through the website and discussion with teaching staff, parents are encouraged to practise skills daily with their children and record successes and concerns in the learning log or home/school diary. Each term parents have opportunity to discuss their child's progress and targets. Regular Maths events are planned to give parents the opportunity to be shown and to discuss teaching methods used at the school and our progression in calculation, including regular workshops.

Date: June 2015
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Date for review: June 2017