Hedon Primary School

Mathematics Policy

Approved by committee 20th October 2020
Approved by full governors 5th January 2020
Reviewed 3rd March 2023
This policy will be reviewed every 2 years unless significant changes current or a situation requires a specific response.

Important policies linked to this one:

- Teaching and Learning Policy
- Calculation Policy
- Feedback Policy
- SEND Policy

Introduction

Mathematics 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.

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics;
- reason mathematically;
- can solve problems by applying their mathematics. (National Curriculum 2014)

Our curriculum

The content and principles underpinning the 2014 mathematics curriculum and the maths curriculum at Hedon Primary School reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. We learn from their education systems by adopting a 'mastery approach' to teaching commonly followed in these countries. These principles and features characterise our approach:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics;
- The large majority of pupils progress through the curriculum content at the same pace.
- Differentiation is achieved by emphasising deep knowledge, and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge;
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts;
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.
- The use of cultural capital to further deepen learning and understanding, model mathematics in the 'real world' and make links between other areas of the curriculum.

The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – 'mastery' – in mathematics.

The Foundation Stage

In the Early Years Foundation Stage (EYFS), we relate the mathematical aspects of the children's work to the Development Matters statements and the Early Learning Goals (ELG), as set out in the EYFS profile document. 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. The profile for Mathematics areas of learning are Number (ELG 11) and shape, space and measures (ELG 12). We continually observe and assess children against these areas using their age-related objectives, and plan the next steps in their mathematical development through a topic-based curriculum.

- There are daily maths/ number sessions in which a number of the week is investigated deeply and follows the guidance from NCETM Numberblocks.
- There are opportunities for children to "bump" into Maths throughout the EYFS (both inside and outside) – through both planned activities and the self-selection of easily accessible quality maths resources.
- Children are just as likely to access the Mathematics curriculum through cooking activities in the kitchen, building activities in the construction area or in the outdoor area.
- Whenever possible children's interests are used as a vehicle for delivering the curriculum. For instance, an interest in dinosaurs may give rise to sorting, counting and recording the number of dinosaurs in small world play.
- Staff support children's learning through planned activities but also value and support self-initiated mathematical learning.
- Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1 they are familiar with a structured lesson / activity.

Years 1 - 6

- Through Years 1 to 6 we use a coherent programme of high-quality materials and exercises, which are structured with great care to build deep conceptual knowledge alongside developing procedural fluency.
- Our KS1 and KS2 teachers use textbooks and workbooks from the 'Maths - No Problem!' series, which is based on the principles of how Mathematics is taught in Singapore and aligned with the National Curriculum 2014, to support their planning and delivery of Mathematics teaching.
- The 'Maths - No Problem!' textbooks and workbooks are arranged in chapters and, over the course of the academic year, all units of the National Curriculum 2014 are covered.
- The 'Maths - No Problem!'programme works through fluency, reasoning and problem solving questions which build up a range of skills over time.
- If the needs of the children are best met following an alternative plan, which deviates from the National Curriculum 2014, then the class teacher, school leadership team and the SENCO discuss this and decide on a way forward.

Lesson Structure - non negotiable

- The following lesson structure is set out in the planning pro-forma provided and must be used for every lesson and a copy placed in the shared planning folder - updated at the end of each week if completed on paper.
- In planning, the top 5 boxes to be completed with pupils from each class - this may vary depending on the subject, progress and time of year.
- Planning to be written using the 'Maths -No Problem!' teacher resource as a base, that is adapted to meet the needs of the class and annotated during/after the lesson to reflect progress, issues and areas of focus etc.

High Flyers Group – Group A		Bottom 20% - Group B	Concern Group - Group C
PP		SEN	
Date	Lesson	Amendments • Sen • Variation • Resources	Assessment notes
Week 1			
4/1/23	Mulitplying pairs of proper fractions - Lesson 12 To be able to multiply simple pairs of proper fractions and write the answer in its simplest form.	Fraction strips (several strips each) Examples 1–6: Multiplying pairs of proper fractions; giving answers in their simplest form.	, , and to work with for intervention as they struggled with simplifying. and got it correct (with support) and struggled. Go back to basic fractions for them tomorrow. See Y2 book.

- Lessons last approximately 1 hour and are taught every day.
- Pupils start the lesson completing a Tough Ten which focuses on age appropriate arithmetic styled questions. The lesson then continues with an **'Explore'** problem, which they discuss in partners and then attempt using either concrete, pictorial or abstract methods. This is a **problem solving** activity, which prompts discussion and reasoning. In Key Stage One, these problems are almost always presented with objects (concrete manipulatives) for children to use. Pupils may also use manipulatives in Key Stage Two. Teachers use careful questions to draw out pupils' discussions and their reasoning.
- The class teacher then leads pupils through strategies for solving the problem , including those already discussed - **'Master'**. At this part of the lesson, the children might need to write down their strategy in their 'Maths Journal'. The strategies may be displayed on sheets of paper in the classroom.
- The class then tries questions in **'Guided Practice'**. Carefully designed **variation** in these questions builds **fluency and deep understanding**. When they are ready to apply their learning independently, the children answer questions in their own workbook.
- If some children are not ready by this point, they will continue 'Guided Practice' with the teacher in a small group.
- If some pupils are advanced in this area of mathematics and have completed the questions independently, they will be given extra tasks to consolidate and deepen their learning, which they will complete in their 'Maths Journal'.

Feedback

Even though 'Maths - No Problem!' is mostly completed in workbooks, all policies linked to teaching, learning and assessment still apply. Inline with the school feedback policy, the class teacher will provide feedback to all work and acknowledge it in books following the policy. Where pupils use their maths journals to tackle 'In Focus' questions or complete jottings/working out, the class teacher will acknowledge the work with pink/yellow highlighter. The most effective feedback is through a dialogue between the pupil and teacher during the lesson; this ensures that pupils know how well they are doing and what they need to improve to make further progress.

Multiplication Tables & TT Rockstars

At the start of each term, teachers will introduce a multiplication table - as set out below - and then focus on it at any opportunity and especially within Maths lesson, adding on the ones covered previously. The children will take a pre and post test to ensure they fully understand the multiplication.

Understanding the **commutative law**, linked division facts and variation of question presentation, e.g. 30 = 5 x 6, must form a huge part of teaching.

	Y1	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Autumn 1	1	2	3	3, 4 & 8	Full	Full
Autumn	2 & doubling	5	4	6	Full	Squared
Spring 1	10	10	3 & 4	7	Squared	Cubed
Spring 2	5	2, 5 & 10	8	9	Squared	
Summer 1	2, 5 & 10	3	8	11 & 12	Full set and squared	Cubed
Summer 2	2, 5 & 10	3	4 & 8	full set	Cubed	Squared and cubed

TTRockstars must be used to support pupil's learning and track progress:

- 1st week in September all data will be reset to zero.
- Knowing all facts and being able to recall them quickly is vital especially for the Year 4 multiplication table check.

Resources

- Teachers' resources are largely based on the 'Maths - No Problem!' series, which can be accessed online. Every teacher has an account and also access to the Academy Video Training library.
- The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into our learning and teaching.
- We have a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching.
- These resources are used by our teachers and children in a number of ways including:
    - Demonstrating or modelling an idea, an operation or method of calculation, e.g.: a number line; place value cards; dienes; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon and related resources and software;

multilink cubes; clocks; protractors; calculators; dice; number and fractions' fans; individual whiteboards and pens; and 2D shapes and pattern blocks, amongst other things;
    - Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required
- Standard resources, such as number lines, multi-link cubes, dienes, hundred squares, shapes, etc. are located within all classrooms **in a clearly defined 'maths area'.**
- Resources within individual classes are accessible to all pupils who should be encouraged to be responsible for their use.
- Further resources (often larger items shared by the whole school) are located in the Mathematics Cupboards.
- Teachers are encouraged to use the school playgrounds as an outdoor classroom when possible, for example, when teaching length, area or perimeter.
- Each child in Years 1 to 6 has access to the subscription only TTRockstars website and Maths Shed, which they can access at home or at school to support their learning of multiplication facts. The website supports the National Curriculum 2014 and learning can be child lead or teacher lead, with individual teachers setting work for the children, which appears when they access the website.

Assessment

NFER tests are used three times a year, in Years 1 to 6, at the end of each term. The outcomes are analysed for patterns and gaps, and are used by teachers and leaders to inform the planning of the following term.

Progress is monitored by the leadership team and the test results are referred to during Pupil progress meetings – which ensures that the needs of every child are being met.

Pupil support and differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. The National Curriculum states:

> *'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.'*

There is little differentiation in the content taught but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining pupils being challenged through more demanding problems which deepen their knowledge of the same content.

Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day.

Inclusion and SEND (please refer also to the Inclusion Policy and SEN Policy)

- Inclusion is about every child having educational needs that are special and the school meeting these diverse needs in order to ensure the active participation and progress of all children in their learning.

- Inclusive practice in Mathematics should enable all children to achieve their best possible standard; whatever their ability, and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation in, or progress in their learning.
- Where the individual needs of a pupil require it, the 'Maths - No problem!' resources can be adapted and/or delivered differently in conjunction with SLT and SEND coordinator.

Parents/Carers

- The School aims to involve parents/carers in their children's learning as much as possible and to inform them regularly of their child's progress in Mathematics.
- Parents/carers have the opportunity to meet with the child's class teacher at least three times a year at Parents' Evening Meetings and receive written reports, as well as being invited to regular Stay and … sessions.
- Parents/carers are encouraged to speak to their child's teacher at any point during the year, either informally or by making a specific appointment.
- School also provides a number of opportunities for parents/carers to learn about what their child is learning and the way their child is being taught through shared resources and communication apps/websites such as Seesaw.
- **Homework** - Year 6 receives specific Maths homework. The rest of the school complete Learning Beyond the Classroom booklets each year and are encouraged to use TTRockstars and Maths Shed at home.

Cultural Capital

Ensuring that a rich and broad curriculum is experienced at Hedon Primary school is very important. This is done in many different ways, responding to local and national events and including, but not limited to, the following:

- making links to current affairs, e.g. plastic use, global warming, refugees, deforestation, creative industries such as gaming, social media and space travel;
- investigating the concept and use of number in different countries and identifying cultural differences;
- investigating how the concept of number has changed over time and learning about mathematical historians such as Pythagoras or Archimedes, and how Mathematics shaped the world by looking at the work of Isambard Kingdom Brunel;
- evidencing the importance of Mathematics in roles such as engineers and scientists Katherine Johnson;
- identifying Maths in nature, e.g. Fibonacci, golden ratio etc;
- using data from events such as Olympic Games or World Cups to analyse and discuss;
- discussing how modern banking works and, at an age appropriate level, learning about debt, savings and credit;
- acknowledging that a growth mindset is vital in all subjects but especially Maths if we are to progress, and that we must recognise and learn from our mistakes.

Cross curricular

Closely linked to cultural capital are the many opportunities we use at hedon Primary school to use mathematical experiences in a range of activities and other subjects, such as in PE, Science and Design and Technology. This allows pupils to apply and use Mathematics in both real life and academic contexts. Experiences are wide and varied and may include, but are not limited to, the following:

- STEM activities;
- opportunities linked to reading content in class novels and whole class reading books;
- cooking such as measuring, weighing and timing;
- data generated in PE and by sporting events,
- historical timelines and dates.

British Values

Values such as respect, tolerance of other opinions and positive criticism are embedded in Mathematics. An underpinning drive to develop pupils who are resilient, respectful, determined and respectful in Mathematics creates a positive set of values to apply to all areas of life.

Subject Leader

- The role of the Subject Leader is to provide professional leadership and management in Mathematics in order to secure high quality teaching, effective use of resources and high standards of learning and achievement for all pupils. This includes delivering quality CPD opportunities, modelling lessons, coaching and mentoring staff and keeping abreast of curriculum changes and assessment arrangements.
- They will achieve this by affecting the following key areas: strategic direction and development; learning and teaching (including planning and marking and presentation); leading and managing staff; and efficient and effective deployment of staff and resources.
- The Subject Leader has regular discussions, including termly pupil progress meetings with teachers, with the Head and other senior leaders about learning and teaching in Mathematics.