



Mathematics Policy

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This policy will be reviewed in 2021

Intent

The 2014 National Curriculum for mathematics aims to ensure that all children:

- become **fluent** in the fundamentals of mathematics,
- are able to **reason mathematically**,
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems

“Mathematics is a creative and highly interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas.” (NC 2014)

At Holmleigh Primary School, we are committed to ensuring that all our pupils are able to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. We are committed to encouraging our pupils to apply their mathematical knowledge and skills confidently in science, other subjects and in other areas of their lives in a range of different contexts. We believe that all children are mathematicians and we want our pupils to enjoy mathematics, to be confident mathematicians, experience success in the subject, to show curiosity and an appreciation of the beauty and power of mathematics.

Equal opportunities

Holmleigh Primary School is committed to ensuring the active participation and progress of all children in their learning.

All children have equal access to the Mathematics curriculum, regardless of race or gender. Children access the curriculum at the level appropriate to them, ensuring rapid measurable progress. Resources and learning environments are planned and designed to enable all children access to the learning required. Differentiated activities are provided to support struggling learners and challenge rapid graspers so they are able to work at greater depth in mathematics.

Inclusion

We have adopted a ‘Mastery’ approach to teaching and learning and therefore differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages. The National Curriculum states:

‘Children 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 children receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems, which deepen their knowledge of the same content before acceleration onto new content.

Children’s difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support.

A range of inclusion strategies, as listed on the school's Inclusion Policy are embedded in practice and teachers are aware of the special educational needs of the children in their class as well as those who have English as an additional language.

Although the expectation is that the majority of children will move through the programmes of study at broadly the same pace, the 2014 National Curriculum states:

'Decisions about when to progress should always be based on the security of children's understanding and their readiness to progress to the next stage.'

If a child's needs are best met by following an alternative plan, including coverage of the content from a previous year, this will be overseen by the SENDCo, in collaboration with the class teacher and with the knowledge of SMT. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during SEND reviews.

Implementation

The three core themes of the 2014 Mathematics National Curriculum: Fluency, Reasoning and Problem Solving inform all maths teaching at Holmleigh Primary School. We have adopted a 'Mastery' approach to teaching and learning and through this; ensure that all parts of the National Curriculum Programmes of Study are taught to a high standard.

We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education.

To ensure consistency and progression, the curriculum is methodically designed and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge. Teachers use the National Curriculum objectives, learning overviews from Primary Advantage maths programme and NCETM's Mastery Assessment materials as a starting point in order to develop a coherent and comprehensive conceptual pathway through the mathematics. The objectives have been grouped together into units lasting between 2 and 4 weeks. Each unit focuses on a small number of key objectives and teaching, staff then develop these objectives and plan lessons which develop the fluency of these objectives, pupils' ability to reason about these concepts and the opportunity to deepen their understanding through engaging in rich problem solving tasks to apply their learning. We focus on topics, such as place value or addition, for a longer period of time to enable pupils to gain a deeper understanding of the mathematical concepts.

Impact

Provision

Pupils are provided with a variety of opportunities to develop and extend their Mathematical skills, including:

- Group work
- Paired work
- Whole class teaching
- Individual work including 1:1 tuition

Pupils engage in:

- the development of mental strategies
- written methods
- practical work
- investigational work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts
- maths games

We recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We use accurate mathematical vocabulary in our teaching and children are expected to use it in their verbal and written explanations.

As aforementioned, mathematics contributes to many subjects and it is important the children are given opportunities to apply and use Mathematics in real contexts. It is important that time is found in other subjects for pupils to develop their Numeracy Skills, e.g. there should be regular, carefully planned opportunities for measuring in science and technology, for the consideration of properties of shape and geometric patterns in technology and art, and for the collection and presentation of data in history and geography.

We endeavour at all times to set work that is challenging, motivating and encourages the pupils to think about how they learn and to talk about what they have been learning. Additional enrichment opportunities are provided for pupils to further develop mathematical thinking e.g. through maths investigations and games.

Teachers plan problem solving and investigational activities every week to ensure that pupils develop the skills of mathematical thinking and enquiry.

To provide adequate time for developing mathematics, maths is taught daily and discretely. Maths lessons may vary in length but will usually last for about 45 minutes in Key Stage 1 and 60 minutes in Key Stage 2.

At Holmleigh Primary School, maths lessons are designed to be interactive with a significant emphasis on children's talk as we understand the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. Through discussing their ideas, children are able to make their thinking clear to themselves, others and teachers, construct new understanding, engage in a supportive community of practice,

take responsibility for their learning and allow the teacher a window into their thinking which enables them to probe, remedy any misconceptions and help the children to make progress.

Like all other subjects, maths is taught in both ability and mixed attainment groups so that all children contribute to and benefit from class discussions and receive both the support and challenge that they need.

Teaching Approaches

Teachers use a range of teaching strategies to engage the children in maths and ensure progress is made by all children within a class; no set formula is used. A typical lesson would include:

- Both teaching input and pupil activities,
- A balance between whole class, guided grouped and independent work, (groups, pairs and individual work)
- Effectively differentiated activities/objectives and appropriate challenge.

Sometimes the focus for the session is new learning, at other times pupils may be practising, to master the application of a concept they have learned earlier. The focus of the session may vary for different children depending on their learning needs.

Teachers plan learning that is differentiated to meet the needs of all pupils, whether they have a specific learning difficulty in maths or whether they are particularly able.

Teachers endeavour to differentiate learning appropriately for high attaining, middle attaining and low attaining pupils – possibly with individual work for an SEN pupil at one end of the achievement spectrum, to individual work for a gifted pupil at the other.

Gifted and talented pupils are challenged and extended in small problem solving groups.

Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention in our Springboard sessions, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.

- Lessons are sharply focused
- Lesson objectives and Success Criteria are shared with pupils
- Key new learning points are identified explicitly.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.

- Key questions are planned and used in lessons to challenge thinking, test conceptual and procedural knowledge and to assess children and move children on
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics is integrated into lessons, including ICT where necessary.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same, what’s different?” are often used to draw attention to essential features of concepts.
- Repetition of key ideas (for example, in the form of whole class recitation, repeating to talk partners etc) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils’ knowledge and understanding and adjusts the lesson accordingly.

Assessment

The teaching and assessing of mathematics at Holmleigh Primary School follows the Assessment for learning cycle of; plan, teach, review, assess. Children's work is marked regularly, as part of our AFL policy and assessed against National Curriculum objectives. Children in EYFS are assessed regularly using the Early Learning Goals.

Assessment for Learning

Children receive effective feedback through teacher assessment, both orally and through written feedback, and AfL is integral to the design of each lesson;

The structure of the teaching sequence ensures that children know how to be successful in their independent work. The Learning Objectives and Success Criteria are shared with children at the beginning of the lesson. Guided practice, which takes place within the main part of the lesson, provides further preparation for children to be able to apply the skills, knowledge and strategies taught. During this part of the lesson, misconceptions are addressed within the teaching sequence and key understanding within each 'small step' is reviewed and checked by the teacher and the children before progression to further depth.

At the end of the lesson, the children review their work and self and peer assessments are used. The children then indicate how confident they feel about their learning by writing a reflection on their learning. The reflections are reviewed by teachers during review of the children's work to inform where consolidation might be required. Opportunities for additional practice and correction are provided by the teacher, as appropriate, during marking, with a focus on promoting and achieving a growth mindset within the subject.

Formative Assessment

Short term assessment is a feature of each lesson. Observations and careful questioning in each lesson enable teachers to adjust lessons and brief other adults in the class if necessary. The lesson structure is designed to support this process and the plenaries at the end of each lesson also allows for misconceptions to be addressed.

At the start and end of each blocked unit of work, the children also complete the carefully aligned Rising Stars Unit Assessments. The outcome of these are used by the teacher to ensure that any identified gaps in understanding can be addressed during the unit and before the next unit is taught. Each child's scores are also input on a class spreadsheet, which provides an overview of achievement in each specific area within the programme of study. This also informs dialogue with parents and carers during open evenings, as well as the judgements made at the end of the term as to the extent that each child has demonstrated mastery of each 'fundamental' objective.

Summative Assessment

Teachers administer a termly arithmetic paper and reasoning and problem-solving paper which specifically links to the coverage for that term. The results of these papers are used to identify children's ongoing target areas, which are communicated to the children, as well as to parents and carers at Parents Evening. They are also used alongside the end of unit assessments and outcomes of work, to inform the whole school tracking of attainment and progress for each child in line with each 'fundamental' objective.

The school's progress tracking O' Track system is updated termly with results from tests completed.

Assessment data in maths is reviewed throughout the year to inform interventions and to also ensure that provision remains well-informed to enable optimum progress and achievement. End of year data is used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform discussions during our termly Pupil Progress Meetings and whole school and subject development priorities for the next school year.

Years 2 and 6 undertake a range of preparation assessments over the course of the year. These tests are used to track progress and attainment, encourage children's confidence, and support the identification of gaps in knowledge and understanding.

National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments. The school's Assessment and Marking Policies inform high quality feedback and pupils' response to it in Mathematics.

Early Years Foundation Stage (EYFS)

We follow EYFS curriculum guidance for Mathematics.

Children in Nursery have a short daily Maths teaching session, during which time they begin to develop their understanding of simple mathematical concepts such as counting to 20, maintaining 1 to 1 correspondence, simple addition and subtraction facts, to recognise and describe simple 2d and 3d shapes. Children are taught these concepts using physical resources, pictorial resources, songs, games and role-play.

In Reception, children have a three part lesson from Autumn 1. This consists of:

1. Whole class oral and mental starter - 5 minutes
2. Whole class main teaching - 10 minutes
3. Focus activity for 8 children, grouped according to current attainment and taught in a ratio of 2 or 3 children to 1 adult

Throughout the week, a child will work with an adult - either a teacher or a supporting adult - on a differentiated task. This activity is completed in 10 - 15 minutes.

This structure to the lesson enables teachers to secure a good balance between whole class work, group teaching and individual practice. It also enables teachers to establish regular routines thereby maximising teaching time. It supports assessment on a daily basis, as well as individual feedback to children, ensuring that children receive immediate intervention as required during the supported focus activity.

In both Nursery and Reception, the independent activities at the Maths table link to the focus for the week. For example, if the focus for the week is addition, then activities on the Maths will often link to this. In addition to these planned independent activities, children also have the opportunity to self-select Maths resources to consolidate their learning during child-initiated activities. We recognise the importance of play-based learning and therefore encourage children to develop their understanding during their play. Such opportunities are provided in both the inside and outside environment.

Regular observations and assessments help to ensure that children that need additional intervention to consolidate their mathematical understanding are identified and supported by appropriate interventions.

Monitoring and Evaluating

Monitoring children's learning together with the quality of Maths teaching is the responsibility of the Maths co-ordinator. The Maths co-ordinator monitor children's books, displays, planning and carries out pupil interviews and learning walks. The work of the Maths co-ordinators also involves supporting colleagues in the teaching of Maths and keeping informed about current developments in the subject.

Resources

The school has a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching.

A bank of essential mathematics resources including Numicon and Cuisenaire rods are kept in classrooms. Additional resources are available in the Maths cupboard.

Parental Support

Holmleigh Primary School recognises that parents and carers have a valuable role to play in supporting their child's mathematical learning and therefore:

We hold a parents 'Meet the Teacher' session at the beginning of each year where the curriculum content is share with parents alongside resources.

An overview of the Maths curriculum is available on the school's website, as well as guidance in the progression in calculation methods used by the school. Paper copies of these documents are also available on request and the curriculum letter, sent home by each year group, also outlines the Maths topics to be covered.

Activities which link to each Maths topic are suggested for parents and carers to try at home.

Children are given Maths homework at least once a week from Reception to Year 6.

Parents and carers are informed of their child's progress at Parents Evenings and this is also communicated in written school reports.

Parents and carers are encouraged to speak to their child's teacher at any point during the year, either informally or by making a specific appointment. Information about their child's

standards, achievements and future targets in Maths is shared during parent/carer meetings, as well as ways that parents/carers may be able to assist with their child's learning.

The 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 parent workshops.

We hold a SATS information session on the maths SATS papers in KS1 and KS2.

Role of the Subject Leader

- Ensures teachers understand the requirements of the National Curriculum and helps them to plan lessons.
- Leads by example by setting high standards in their own teaching.
- Prepares, organises and leads CPD and joint professional development.
- Works with the SENDCO
- Observes colleagues from time to time with a view to identifying the support they need.
- Attends CPD provided by The Learning Trust and other providers.
- Keeps parents informed about Mathematics issues
- Discusses regularly with the Headteacher and the mathematics governor the progress of implementing National Curriculum for Mathematics in school
- Deploys support staff to address mathematics related needs within the school.
- Monitors and evaluates mathematics provision in the school by conducting regular work scrutiny, learning walks and assessment data analysis.

This policy should be read in conjunction with the Calculations Policy.

The Primary National Curriculum for Mathematics

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335158/PRIMARY_national_curriculum_-_Mathematics_220714.pdf

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