

Maths Policy



Our Lady and St. Oswald's Catholic Primary School

APPROVED BY GOVERNORS:

REVIEWED: January 2024

RESPONSIBLE PERSON: Maths Subject Lead

Teaching for Mastery Maths Policy

What is Mathematics

Mathematics is a creative and highly interconnected 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.

(National Curriculum 2014)

Aims

We aim to provide a curriculum that promotes enjoyment and enthusiasm for learning mathematics through practical activity, exploration and discussion in order to create mathematicians, who are able, confident and fluent in the fundamentals of mathematics. We use the Early Learning Goals and the Programme of Study from the National Curriculum, Mastery of Number, Times Tables Rock Stars, Number Makes Sense and Classroom Secrets to provide a Mastery Mathematics pedagogy.

The National Curriculum for Mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

(National Curriculum 2014)

The purpose of mathematics in our school is:

- To foster positive attitudes towards mathematics by developing pupils' confidence, independence, persistence and co-operation and an awareness of the relevance of mathematics in the real world.
- To enable pupils to be proficient, competent and confident with numbers and measures, and to have an ability to solve number problems in a variety of contexts using and applying the mathematical knowledge, concepts and skills taught and developed over time.
- To encourage children to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations and to develop an argument, justification or proof using their mathematical skills, using these skills to solve problems, reason, think logically and work systematically and accurately.
- To develop children's initiative and motivation to work both independently and in cooperation with others.

- To promote use of the language of Maths to communicate confidently about maths confidently and express their ideas fluently, where pupils ask and answer questions, openly share work and learn from mistakes.
- To develop an awareness of the applications and use of Maths in their everyday environment and across the curriculum and to realise that Maths will frequently help to solve everyday problems.
- To have an understanding of mathematics through a process of enquiry and investigation.

Guidelines

Our Lady & St. Oswald's Catholic Primary School, believes that mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas.

The programmes of study are organised into apparently distinct domains / blocks but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace, using the Mastery Maths Teaching approach, using interventions immediately during the class session when necessary.

However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly ('rapid graspers') are challenged through being offered rich and sophisticated problems and carefully planned, high order questioning. Those who are not sufficiently fluent with earlier material consolidate their understanding, including through additional practice, before moving on.

Throughout the school blocks of learning will be taught using the **Concrete – Pictorial – Abstract** model. The CPA model builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving from concrete materials (doing stage) - during this stage, students use concrete objects to model problems, to pictorial representations (seeing stage), where visual representations of concrete objects are used to model problems and finally to the abstract (symbolic stage) where children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols (for example, +, −, ×, ÷).

Equal Opportunity

At Our Lady & St. Oswald's Catholic Primary School, all children have equal access to the full Mathematics curriculum irrespective of age, ability, culture or gender.

Depth of Learning

Depth of learning is a fundamental principle to our mathematics teaching at Our Lady & St. Oswald's Catholic Primary School. Children explore mathematical challenges through a range of experiences; using manipulatives, representations and visual prompts to scaffold their understanding of mathematical ideas. Through careful planning and preparation, we aim

to ensure that throughout the school children are given opportunities for:

- daily practice of basic written and mental arithmetic to ensure fluency of number facts
- problem solving, both across the curriculum and in every lesson
- individual, group and whole class discussions and activities
- open and closed tasks, providing opportunity to investigate mathematical concepts
- exploration of a range of manipulatives and representations
- development of conceptual understanding and exploration of complex problems
- daily challenge through carefully planned variation
- Using jottings to explore ideas and thinking

Organisation

Our children follow a mixed age curriculum where learning within each topic is differentiated to meet the needs of the different aged children in each class. We plan a series of Blocks which cover all of the programmes of study from the National Curriculum (September 2014). The development of these units is carefully monitored to ensure that the curriculum suits all learners needs and is ambitious, enabling the majority of children to meet age-related expectations.

All children in KS1 and KS2 participate in two daily mathematics lessons, Mastery of Number in KS1 and Times Tables practice in KS2 and Mastery for Maths as the main part of the lesson. Number Sense Maths is used as an intervention programme in KS2. Reception follow the EYFS Statutory Framework 2014 which sets standards for the learning, development and care of children from birth to five years old and supports an integrated approach to early learning. This is supported by the `Development Matters` non statutory guidance.

The EYFS Framework in relation to mathematics aims for our pupils to:

- develop and improve their skills in counting.
- Understand and use numbers
- Calculate simple addition and subtraction problems.
- Describe shapes, spaces and measures.

The framework for the teaching and learning of mathematics in Our Lady & St. Oswald's Catholic School is the National Curriculum in England: mathematics programme of study. This is delivered through a range of individually designed and commercially produced resources, most significantly `Classroom Secrets` and `Times Tables Rock Stars`, which are available to all classes, with online support.

Cross Curricular Links

Throughout the whole curriculum opportunities are planned to teach, extend and promote mathematics. Teachers seek to take advantage of all opportunities through cross curricular mathematical challenges.

INTENT

Teaching for Mastery Principle

In September 2017, Our Lady & St. Oswald's Catholic Primary School began transitioning towards a mastery approach to the teaching and learning of mathematics. We understood that

this would be a gradual process and take several years to embed. The rationale behind changing our approach to teaching mathematics lay within the Mathematics Specialist Teacher Programme, the NCETM/ Maths Hub led Mastery Specialist Programme as well as the 2014 National Curriculum, which states:

The expectation is that most pupils will move through the programme 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.

Teachers use the small steps of progression planning to ensure development of children's learning takes place over time and that the curriculum is covered systematically. Teachers' planning is supported by (but not inclusively limited to), high quality text books and web based resources such as 'Classroom Secrets', and resources and video material from the NCETM and NRICH.

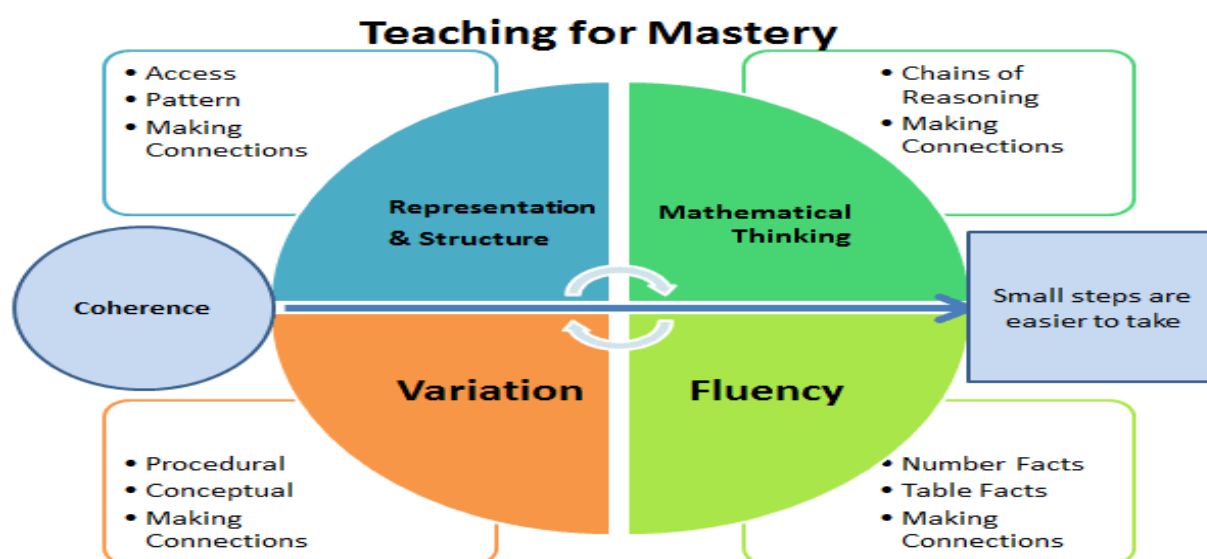
Our Lady & St. Oswald's Catholic Primary School is now a school with embedded Mastery Approach teaching during all maths lessons.

Daily Lesson Plans

It is agreed that the best use of teacher time is in planning the small steps and elements of the lesson that the children access, as a result the teachers lesson plan is in the form of the lesson power point presentation, supported with paper based challenges when appropriate.

To support the daily planning power points, the teachers use NCETM PD Materials, together with NRICH, Classroom Secrets, Multiplication Tables Check, Times Tables Rocks Stars, Mastering Number and White Rose Maths to support.

Our teaching for Mastery is underpinned by the 5 Big Ideas.



The 6 Teaching Principles

1. Teachers believe in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations. Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage.
2. The whole class is taught mathematics together, with no differentiation by acceleration to new content. **We do not group children by ability.** The learning needs of individuals are addressed through careful scaffolding, questioning and appropriate rapid intervention where necessary, to provide the appropriate support and challenge.
3. The reasoning behind mathematical process is emphasized. Teacher/pupil interaction explores **how** answers were obtained as well as **why** the method worked and what might be the most efficient strategy. Factual knowledge (e.g. number bonds and times tables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. of place value) are taught in a fully integrated way and are all seen as important elements in the learning of mathematics.
4. Precise mathematical language, often couched in full sentences, is used by teachers so that mathematical ideas are conveyed with clarity and precision. We value 'mathematical talk' and children get lots of opportunity to talk about and evaluate their mathematics during lessons.
5. **Conceptual Variation** and **Procedural Variation** are used extensively throughout teaching. This helps to present the mathematics in ways that promote deep, sustainable learning.
 - a. Conceptual Variation is where the concept is varied and there is intelligent practice. Positive variation is showing what the concept is, and negative variation is showing what the concept isn't. This clears away misconceptions at the very start. Within positive variations, both standard and non-standard representations are shown.
 - b. Sufficient time is spent on key concepts to ensure learning is well developed and deeply
6. Procedural variation is where different procedures and/or representations are used to efficient method. It also involves highlighting the essential features of a concept or idea through varying the non-essential features. Variation is not the same as variety – careful attention needs to be paid to what aspects are being varied (and what is not being varied) and for what purpose, embedded before moving on.

Components of a typical mathematics lesson

The approach to the teaching of mathematics within Our Lady & St. Oswald's Catholic Primary School is based on five key principles:

- a daily mathematics lesson to focus on place value, number and calculations or GSM (geometry shape and measure),
- a clear focus on interactive direct teaching alongside exploration work with the whole class and groups coupled with investigative elements. There is a strong emphasis on high quality questioning, use of correct vocabulary and sentence stems,
- an emphasis on mental calculation, using and applying and depth of learning,
- a commitment to developing the mastery approach, whereby all children have access to and experience of first quality teaching of their year group's small steps to include daily challenge.

Section of Lesson	What is comprises.	Content may include...
10.45-11.10 Mental Maths	Times Tables / Number Bonds	TTRS MTC Mastering Number Programme
11.10-12.00 Mastery Maths Lesson	Instruction – giving information and structuring it well. Demonstrating – showing, describing and modelling mathematics using appropriate resources and visual displays. Explaining and illustrating – giving accurate and well-paced explanations. Questioning and discussing Consolidating Reflecting and evaluating responses- identifying mistakes and using them as positive teaching points. Summarising – reviewing mathematics that has been taught enabling children to focus on next steps.	Based on the objectives from the National Curriculum 2014 for the appropriate year groups. • Introducing new work. • Extending or consolidating new and previous work. • Using and applying what has been used. • Assessing what has been taught. • Revising and further practice. Cold Tasks • S planning • 3-part Direct teaching. • 3-part small reinforcing exercises • AFL questioning to ascertain understanding • Immediate interventions • Hot Tasks
Throughout the Mastery Session	Pupils' self-assessments of the learning taking place. Short reports from groups who have been working independently. Reflection of the lesson and summary of key ideas and facts. Explanation of what the class will do next.	Identifying and putting right common errors or misunderstandings. Identifying what to remember. Making links to other work. Giving work out to complete out of class / at home for consolidation purposes.

Implementation

7 Features of Lesson Design

1. Lessons are short but intense; teacher input usually lasts around 50 minutes giving ample time for independent practice whilst the teacher delivers **rapid intervention** should somebody require it. Independent practice includes reasoning, problem solving and higher-order thinking activities.
2. Lessons are sharply focused with one new objective introduced at a time.
3. Difficult points and potential misconceptions are identified in advance and strategies to address them planned. Key questions are planned, to challenge thinking and develop learning for all pupils.
4. The use of high quality materials and tasks (NRICH, NCETM Mastery Assessment Materials) to support learning and provide access to the mathematics is integrated into lessons.
5. There is regular interchange between concrete / contextual ideas and their abstract/symbolic representations.
6. Making comparisons is an important form of developing deep knowledge. The questions "What's the same, what's different?" are often used to draw attention to essential features of concepts.
7. 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. This forms part of the mastery instructional process.

Lesson A → Formative Assessment → Enrichment in maths books/rapid intervention → Lesson B

Curriculum Design

- Programmes of study and lesson content are carefully sequenced, in order to develop a coherent and comprehensive conceptual pathway through the mathematics.
- Learning is broken down into small, connected steps, building from what pupils already know.
- Children are allowed time to reflect on new concepts through Partner Talk and Golden Nugget, Retriever and Elephant exercises.
- Retrieval Practice is used to embed and retrieve knowledge and is used within the lesson daily.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Key questions are planned, to challenge thinking and develop learning for all pupils.
- 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. These may include (limited use of approved) textbooks, visual images and concrete resources.

Features of Teaching

- Lessons are sharply focused; digression is generally avoided.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete / contextual ideas, pictorial representations and their abstract / symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to the pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions "What is 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 frequently used. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think

Planning

EYFS

Teaching in EYFS is based on objectives in the 'Curriculum Guidance for the Foundation Stage;' this ensures that they are working towards the 'Early Learning Goals for Mathematics'. As a school we have also developed a list of the key skills children we would like to master by the end of Foundation Stage in order for them to be fully prepared to access learning in Year 1. The children are given access to daily mathematical challenges

through continuous provision and in addition, participate in adult led mathematics sessions in preparation for Year One. The teachers follow the calculation policy to ensure continuity with the Key Stage One setting. Evidence for maths learning can be found in learning journals. For Number in particular, EYFS follow the Number Blocks programme supported with teaching materials from NCETM and the Mastering Number programme from the HUB.

Long Term Planning

The National Curriculum for Mathematics 2014, Development Matters and the Early Learning Goals (Number, Shape Space & Measure) provide the long term planning for mathematics taught in the school.

Medium Term Planning

Years 1-6 do not follow a prescribed scheme of work for maths, although use Classroom Secrets as a scaffold to develop plans from. Lessons are created following teacher's initial assessments (Cold Tasks) and plans based on the learning journey required by the pupils. NCETM, NRICH documents and planning guides are used to support with exemplifications for maths objectives and are broken down into fluency, reasoning and problem solving. They all support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required year group and support the idea of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem solving elements into the curriculum.

Short Term Planning

The above schemes of learning support daily lessons / power points / active inspire planning. Lessons are based on the planning from CS and their own knowledge of what the children need based on baseline assessments or cold tasks, and teachers are not required to write individual daily lessons plans.

Marking

Marking of children's work is essential to ensure they make further progress. Work is marked against success criteria, in-line with the school's marking policy and includes next steps where appropriate. The 'child Friendly Marking Guidance' for pupils is displayed on the inside of the front cover of every pupil's book. Children are encouraged to self-assess their work and given time to respond to teacher's comments and make corrections and improvements using their GREEN PENS. Responses to marking are made as close to the work as possible, ideally at the start of the next lesson. Some pieces of work in mathematics can be marked by the children themselves, exercises involving routine practice with support and guidance from the teacher.

IMPACT

Assessment

Assessment is an integral part of teaching and learning and is a continuous process.

Formative (Day by Day) Assessment

Using the 2014 curriculum materials, teachers make regular assessments of children's daily work through:

- Cold Tasks – completed at least two weeks prior to the beginning of the unit. Blue Paper or highlighted with blue marking.
- Regular daily marking of work.
- Analysing of errors and picking up on misconceptions.
- Asking questions and listening to answers – AFL.
- Facilitating and listening to discussions.
- Making observations.
- Hot tasks – completed at least 2 weeks following the completing of the task. Pink/red paper or highlighted with red marking. Progress is tracked on teachers tracking sheets.

Lessons are adapted readily and short term planning evaluated in light of these assessments. Assessment are recorded systematically and the data used to inform planning and to identify and address any misconceptions. Assessment in mathematics is formative and summative and allows the S.L.T. to track each child's learning journey termly.

End of Key Stage Assessment

Termly assessments are carried out across the school, every term, using the PUMA Assessment Materials for each year group apart from Y6 who are assessed against SATs. These assessments alongside the judgements made from class work, support the teachers in making a steps assessment for each child which in line with the assessments policy is entered onto the school's long term tracking proforma.

Pupil progress meetings are held termly by the SMT. Progress of pupils is discussed and appropriate interventions are considered and put into place where appropriate.

Long Term

Reception, Y2 and Y6 are Baseline assessed at the beginning of the academic year. The level of progress is tracked termly, by completing SATS and PUMA. Y6 complete the national Tests in May.

Summative Assessments

Once a term, from the autumn term Y1, the children will undertake a summative assessment (see assessment tasks outlined in the table below). As a school we use 'NEW PUMA – Progress in Understanding Mathematics Assessment Tests. Once these assessments have taken place the results are recorded via the online Mark system and analysed by the class teacher and SLT to analyse if children are meeting the standards for their age and if interventions or training for staff is required.

	Autumn	Spring	Summer
EYFS	Statutory Baseline assessment	Assess against the ELG'S on a termly basis through observations and adult led activities (on going during the year).	End of EYFS Profile Teacher Assessment which is submitted to the Local Authority.
Year 1	New PUMA Y1 Autumn Test	New PUMA Y1 Spring Test	New PUMA Y1 Summer Test
Year 2	New PUMA Y2 Autumn Test	New PUMA Y2 Spring Test	New PUMA Y2 Spring Test

	Autumn SAT		
Year 3	New PUMA Y3 Autumn Test	New PUMA Y3 Spring Test	New PUMA Y3 Summer Test
Year 4	New PUMA Y4 Autumn Test	New PUMA Y4 Spring Test	New PUMA Y4 Summer Test
Year 5	New PUMA Y5 Autumn Test	New PUMA Y5 Spring Test	New PUMA Y5 Summer Test
Year 6	Baseline SAT	Spring SAT	National end of KS2 Maths Test

Assessments are recorded systematically and the data used to inform planning and to identify and address any misconceptions. Assessment in mathematics is formative and summative and allows the S.L.T. to track each child's learning journey termly.

Formative Assessment

As well as termly formal assessments, we assess children's work in Mathematics regularly (through teacher observations, AFL Tasks / questions, marking, questioning, guided work groups) and use this to help us adjust our daily plans in order to tailor learning activities to suit the needs of the child/group/class. Wherever possible live marking and instant feedback is promoted.

Parent Meetings / Target Setting

During the autumn and spring terms, teachers have a meeting with parents where progress is discussed. During this meeting, the parents and teachers (and children in Y6 and other classes if so desired) discuss personalised targets for the term. The parents will be given a document noting scores for tests, targets and observations to support parents' understanding of progression and how to help.

Reporting to parents

A written report is completed towards the end of the summer term and parents are given the opportunity to discuss their child's progress on two separate occasions (autumn and spring). However, if a teacher, parent, carer has a concern with a child's progress (that they feel cannot wait), they are welcome to make a convenient appointment.

Parental Involvement

We value the support of our parents and try to involve them in their child's mathematical development where possible by trying to hold a range of events:

Inviting them in twice a year to view their child's work.

Holding maths for parents' workshops once a term.

As and when relevant, we hold open mornings or meetings for parents to update and inform them e.g. changes to calculation methods or policies, or support for helping at home with e.g. multiplication or number facts, information for SATs etc.

Special Educational Needs & Disabilities (SEND)

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, children's PCP's incorporate suitable objectives from the National Curriculum for Mathematics or Development Matters and teachers keep those in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the mathematics lesson. Mathematics focused intervention in school helps children with

gaps in their learning and mathematical understanding. These are delivered by trained support staff and overseen by the SENCO and / or the class teacher.

Within the daily mathematics lesson teachers have a responsibility to not only provide differentiated activities to support children with SEND but also activities that provide sufficient challenge for children who are high achievers. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability.

Recording of Work

Children are taught a variety of methods for recording their work and they are encouraged and helped to use the most appropriate and convenient method of recording e.g. formal written methods, informal jottings, pictures and photographs etc.

The Role of the Subject Lead

Co-ordination

The role of the Maths Leader:

- Take the lead in policy development and implementation.
- Ensure progression and continuity in Maths throughout the school.
- Monitor and evaluate standards of achievement in Maths and advise the SLT on action.
- Monitor the Maths learning environment and resources.
- Support and monitor teaching and learning in Maths.
- Produce yearly action plan for Maths.
- Termly review of progress against targets in Maths action plan and School Development Plan.
- Organisation of observation of Maths lessons, learning walks, drop-ins, sampling of books, pupil conferencing etc
- Facilitating of moderation across year and phase groups.
- Support colleagues in development of plans.
- To organise personal C.P.D for staff according to need.
- Take responsibility for the purchase and organisation of resources.
- Keep up to date with developments in Maths education and disseminate information to colleagues both informally and as INSET and to parents as appropriate.

Monitoring

Monitoring the standards of children's work and the quality of teaching in mathematics is carried out regularly. The work of the mathematics subject leader involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject and providing strategic leadership and direction for the school. The subject leader has time out of class to undertake learning walks across the school and review samples of children's work and teachers planning.

In order to ensure continuity in both planning and the quality of the work a rigorous monitoring timetable involving both S.L.T and governors is in place. This includes:

- Learning Walks will take place at least once a year.
- Regular "drop in's" take place across the year.
- Book scrutinies will take place at least once a term.
- Pupil conferencing will also take place termly.

Resources and Learning Walls

All teachers should organise an area within the classroom dedicated to mathematics resources. This area should be accessible to all children and therefore allow them to become familiar with resources. Resources, which are not used regularly and are stored in the KS1 classroom or KS2 corridor.

Teachers should dedicate one display board for a mathematical learning wall. Here they should display support for their current area of learning, model written calculations and provide support, which will help children in their independent learning.

Governance

The governors maintain an overview of all of the curriculum areas through Full Board meetings held three times a year in which the RE Curriculum & Standards committee report their findings. During the RE Curriculum & Standards committee meetings, the committee members are able to question the Geography Lead Teacher on the progress of the Action Plan, the key developments and next steps. These are then reported to the Full Board.

The RE Curriculum & Standards committee will review this policy in two years and then pass to the Full Board for ratification.

The governing Body are invited in to speak to teachers and the Lead teacher for maths three times a year during Link Governor Weeks. The governors are also invited to:

- to attend relevant training and school INSET.
- liaise with the Mathematics Lead
- visit the school at least yearly
- talk with teachers and when possible, Learning Walks for some mathematics lessons during Link Governor weeks.