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Ingrow and Long Lee Federation

Maths Policy (Teaching for Mastery)

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This document defines the fundamental elements of primary mathematics teaching for mastery. Much of the pedagogy is based on the NCETM's research into primary mathematics teaching in East Asian jurisdictions, especially Shanghai, and on the experience of English primary schools involved in the China-England mathematics education research project. It is fully consistent with the Primary National Curriculum in England.

Rationale

This policy is the formal statement of intent for teaching for mastery in mathematics across the Ingrow and Long Lee Federation. The policy facilitates how we, as a school, have adapted our lessons to incorporate the fundamental elements of primary mathematics teaching for mastery and how we follow the National Curriculum requirements. This policy has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all teaching staff.

Aims

Across our Federation, we aim to:

- provide our pupils with a mathematics curriculum which will produce individuals who are numerate, literate, creative, independent, inquisitive, enquiring and confident
- provide a stimulating environment and adequate resources so that pupils can develop their mathematical skills to their full potential
- ensure all pupils become **fluent** in mathematics through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- to **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language, and
- enable our pupils to **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

Our expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of the pupil's understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving on.

Teaching and Learning

- Teachers will follow the National Curriculum (introduced 2015-2016), using the appropriate programme of study for their specific year group
- Children will spend fifteen minutes per day, in addition to their daily maths lesson, developing their skills of instant recall and fluency through the Maths Passport system.
- The children will be shown how to use resources to visualise concepts and ideas and ultimately to aid their understanding. All children, regardless of ability, will be shown visual representations of the concepts taught.
- Pupils will be provided with a variety of opportunities to develop and extend their mathematical skills, including: group work, with either the teacher or class support; paired work; whole class teaching and individual work
- Children are taught efficient written methods of calculation as stated in the school's Calculation Policy. (see Calculation Policy for further guidance)
- Daily Lesson Challenges and Success Criteria/ Steps to Success will be shared with the children throughout each maths lesson and the Lesson Challenge(LC) will be recorded in the child's book either by themselves or an adult, as appropriate
- Pencils will be used in all maths books and all lines drawn will be drawn with a ruler
- The development of our pupils' mental recall will be supported by daily work through the Maths Passports. Assessment of these objectives will be ongoing and should, in most cases, be achieved on three separate occasions to ensure a child is secure in the objective. (see Maths passport policy for further guidance)
- Teachers will ensure all children have easy access to a variety of resources to help to visualise abstract concepts and also to allow them work independently throughout all age ranges
- Teachers should make full use of ITPs and other ICT resources to enhance their maths lessons.
- Teachers will, wherever appropriate, include mathematics in other subjects including the creative curriculum, and in particular Science e.g. to support the children's understanding and application of statistics

Teaching principles

- 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.
- The whole class is taught mathematics together, with no differentiation by acceleration to new content. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge. This will include bespoke pre and post teach to individual needs by either a teacher or skilled teaching assistant.
- 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.

- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail **how** answers were obtained, **why** the method/strategy worked and **what** might be the most efficient method/strategy.
- Interim methods (e.g. expanded methods for addition and multiplication) to support the development of formal written algorithms are used for a short period only, as stepping stones into efficient, compact methods.
- Precise mathematical language, couched in full sentences, is **always** used by teachers and teaching assistants, so that mathematical ideas are conveyed with clarity and precision. Pupils are required to do the same (e.g. when talking about fractions, both the part and its relationship to the whole are incorporated into responses: " *The shaded part of the circle is one quarter of the whole circle*").
- Conceptual variation and procedural variation are used extensively throughout teaching, to present the mathematics in ways that promote deep, sustainable learning.
- Carefully devised exercises employing variation are used. These provide **intelligent practice** that develops and embeds fluency and conceptual knowledge.
- Sufficient time is spent on key concepts (e.g. multiplication and division) to ensure learning is well developed and deeply embedded before moving on.
- Frequent additional practice, outside the lesson, is encouraged, in order to develop pupils' fluency and consolidate their learning.

Lesson 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.
- 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 textbooks, visual images and concrete resources.

Features of teaching

- The main 'teaching' part of the lesson is short but intense, 25 to 35 minutes. This allows for an additional time to be spent working on practice and intervention.

- Lessons are sharply focused; digression is generally avoided.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas 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 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, often in the form of whole class recitation, 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.
- Desks are arranged so that all pupils can face the teacher and can work in pairs or small groups when needed.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils' knowledge and understanding are identified early by in-class questioning and by reviewing learning as pre assessment. Potential misconceptions are addressed rapidly through individual or small group intervention, either on the same day or the next day, separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Short homework/out of class tasks are set, to consolidate learning and provide formative feedback.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

Homework

Mathematics lessons will provide opportunities for our children to practise and consolidate their skills and knowledge and to develop and extend their techniques and strategies - homework will be provided to support this.

Children will be encouraged to practice daily, at home, their passport objectives - these are listed on the back of each child's completed certificate for the previous continent and can also be found on our school's website. We acknowledge the importance of parental involvement and hope that parents will help their child extend the above through short and focused homework tasks and activities.

Assessment

Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class. In our school, we are continually assessing our pupils and recording their progress. We see assessment as an integral part of the teaching process and strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress.

Information for assessment will be gathered in various ways: by talking to the children, observing their work, marking their work, etc. Teachers will use these assessments to plan further work.

- Teacher assessment will be on going, with a more formal assessment taking place at the end of each term in the form of a 'Health Check'
- Children are assessed against their year group expectations. A copy is in the front of each child's maths book and the teacher has a whole class assessment document. Both records are updated in line with the Federation's assessment procedure.
- In EYFS, assessment will begin with a baseline assessment during Autumn 1, followed by assessments as set out in our schools EYFS policy

Role of the Mathematics Leader

The Maths Leader is responsible for mathematics throughout the school. This includes:

- Leading by example by setting high standards in their own teaching
- Ensuring teachers understand the requirements of the new National Curriculum and support them to plan lessons, where needed
- Preparing, organising and leading CPD and joint professional development, sometimes supported by consultants
- Working with the Inclusion Leader
- Observing colleagues from time to time with a view to identifying the support they need
- Attending CPD and disseminate knowledge through staff meeting/INSET
- Keeping parents informed about mathematics issues
- Discussing regularly with the Strategic Leader, Head of School, SLT, Maths governor and/or Achievement and Standards governors, the progress mathematics in school
- Monitoring and evaluating mathematics provision in the school by conducting regular work scrutiny, learning walks and assessment data analysis and feed back to SLT
- Ensuring each classroom has the appropriate resources required to deliver the curriculum effectively and, where necessary, use maths budget to fill gaps

APPENDIX 1: INGROW AND LONG LEE FEDERATION MATHS LTP - 2016-2017

INGROW AND LONG LEE FEDERATION MATHS OVERVIEW - Autumn 2016

	Wk1 5 TH Sep	Wk 2 12 th	Wk3 19 th	Wk4 26 th	Wk5 3 rd Oct	Wk6 10 th	Wk7 17 th	24 TH	Wk8 31 st	Wk9 7 th Nov	Wk10 14 th O-track	Wk11 21 st	Wk12 28 th	Wk 13 5 th Dec	Wk 14 12 th Health check
Year 1	BASELINE	Place Value			Addition & Subtraction			HALF TERM	Shape	Addition & Subtraction		Addition & Subtraction			CONSOLIDATION
Year 2		Place Value	Addition & Subtraction			Length & Mass	Graphs		Multiplication & Division						
Year 3		Place Value	Addition & Subtraction			Multiplication & Division			Measurement						
Year 4		Place Value			Addition & Subtraction				Multiplication & Division			Area			
Year 5		Place Value			Addition & Subtraction				Multiplication & Division			Statistics			
Year 6		Place Value	Addition, Subtraction, Multiplication & Division			Fractions									

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MATHS OVERVIEW - Spring 2017

	Wk 1 2 nd Jan	Wk 2 9 th	Wk 3 16 th	Wk4 23 rd	Wk5 30 th O-track	Wk6 6 th Feb	Wk7 13 th	20 th	Wk8 27 th	Wk9 6 th Mar	Wk 10 13 th	Wk11 20 th	Wk12 27 th	Wk13 3 rd Apr Health Check	X M A S H O L I D A Y
Year 1	Time		Place Value			Add & Sub	Length & Height	H A L F T E R M	Multiplication & Division		Fractions		Consolidation		
Year 2	Money		Shape			Shape	Shape		Fractions		Consolidation				
Year 3	Multiplication & Division		Measures			Measurement			Fractions		Consolidation				
Year 4	Fractions					Time			Decimals		Money				
Year 5	Fractions					Fractions			Decimals		Percentages				
Year 6	Decimals		Perc %	Measures		Measurement			Algebra		Geometry & Statistics				

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MATHS OVERVIEW - Summer 2017

	Wk1 24 TH Apr Health Check O-track	Wk2 1 st May	Wk3 8 th	Wk4 15 th	Wk5 22 nd		Wk6 5 th June	Wk7 12 th	Wk8 19 th	Wk9 26 th O-track	Wk10 3 rd July	Wk11 10 th Health Check Final Otrack	Wk 12 17 th			
Year 1	Place Value			Add, Subtract, Multiply and Divide		H A L F T E R M	Add, Subtract, Multiply and Divide	Money		Weight & Volume				S U M M E R H O L I D A Y S		
Year 2	Time		Capacity Volume temperature	SATS			POST SATS PROJECTS									
Year 3	Fractions				Shape		Shape		Measurement		stats	consolidation				
Year 4	Perimeter length	Angles		Shape and Symmetry			Position & Direction		Position & Directio n	Statistics		Area And Perimeter				
Year 5	Angles		Shape		Position & Direction		Converting Units		Prime number	Perim and Area	Volume					
Year 6	Properties of Shapes		Position and Direction		POST SATS PROJECTS		POST SATS PROJECTS									