Mathematics: Intent, Implementation and Impact (July 2020)

Intent

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 (DFE-00180-2013)
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.

Mathematics is vital for the life opportunities of our children. Our aim is for all children to think mathematically, enabling them to reason and solve problems in a range of contexts. Our intent at Bayford Primary School is that children "can do" maths and we want every child to experience a sense of awe and wonder as they solve a problem for the first time, discover different solutions and make links between different concepts. This is enhanced by providing pupils with a deep understanding of the subject through a concrete, pictorial and abstract approach.

Features of our curriculum at Bayford Primary

The National Curriculum is delivered through the use of Herts Essential Maths. Coverage will be ensured by implementing the Herts Essential termly overviews (attached below in strand and content domain format.) The termly overviews identifies the objectives for each topic block which are derived directly from the National Curriculum. The objectives in each block are broken down in to a series of carefully planned learning steps. This content will be taught in order from September 2020 as it is designed to gradually develop children's understanding and show progression. Maths teaching is supported through daily short Fluency sessions where children have the opportunity to revisit and review their prior learning.

Schedule of teaching 2020/21
Year 1 and 2

Term 1		
Additional learning sequence*	1&2_additional_LS Addition and Subtraction Strategies for Rehearsal	
Week one	1&2_LS1	Positional Language and Sequencing
Week two	1&2_LS2	Subitising – Leading to More and Fewer
Week three	1&2_LS3	Number Magnitude, Estimation and Comparison
Week four - five	1&2_LS4	Place Value – Making Ten(s) and Some More
Week six	1&2_LS5	Time – Estimating, Sequencing and Comparing
Week seven - eight	1&2_LS6	Additive Reasoning – the Understanding and Language of Operations
Week nine	1&2_LS7	Part Whole
Week ten - eleven	1&2_LS8	Equality and Comparison
Week twelve	1&2_LS9	Measures – Length, Height and Mass

Term 2		
Week one	1&2_LS10	Geometry 1
Week two - three	1&2_LS11	Regrouping to Add and Subtract
Week four	1&2_LS12	Strategy Choices for Addition and Subtraction
Week five	1&2_LS13	Problem Solving with Addition and Subtraction
Week six	1&2_LS14	Doubling and Halving
Week seven	1&2_LS15	Multiplication – Counting, Multiples and Repeated Addition
Week eight	1&2_LS16	Multiplication – Number of Groups, Group Size and Product
Week nine	1&2_LS17	Division – Sharing and Grouping
Week ten	1&2_LS18	Problem Solving with Multiplication and Division

Term 3		
Week one	1&2_LS19	Money
Week two - four	1&2_LS20	Fractions
Week five	1&2_LS21	Problem Solving – All Four Operations
Week six	1&2_LS22	Time – Turns and Telling the Time
Week seven	1&2_LS23	Time – Drawing the Hands on a Clock and Intervals of Time
Week eight	1&2_LS24	Measures and Reading Scales
Week nine	1&2_LS25	Statistics
Week ten	1&2_LS26	Geometry 2
Week eleven	1&2_LS27	Place Value with Larger Numbers
Week twelve	1&2_LS28	Calculation Review
Remaining weeks should be review and close the gap sessions focusing on high value learning – place value, mental and written fluency		

Year 3 and 4

Term 1		
Week one-two	3&4_LS1	Number and Place Value Reasoning 1
Week three - four	3&4_LS2	Additive Reasoning 1 – Mental Addition
Week five - six	3&4_LS3	Additive Reasoning 2 – Mental Subtraction
Week seven - eight	3&4_LS4	Multiplicative Reasoning 1 – Building Fact Recall
Week nine - eleven	3&4_LS5	Proportional Reasoning 1 – Scaling, Comparison and Fractions
Week twelve	3&4_LS6	Geometric Reasoning 1 – Angles and Lines
Remaining weeks should be review and close the gap sessions focusing on high value learning – place value, mental and written fluency		

Term 2		
Week one	3&4_LS7	Proportional Reasoning 2 – Adding and Subtracting Fractions
Week two	3&4_LS8	Geometric Reasoning 2 – Properties of 2-D shape
Week three - five	3&4_LS9	Additive Reasoning 3 – Formal Written Addition and Subtraction
Week six	3&4_LS10	Spatial Reasoning 1 – Perimeter
Week seven	3&4_LS11	Statistical Reasoning 1 – Scaling
Week eight	3&4_LS12	Multiplicative Reasoning 2 – Multiplicative Laws and Area
Week nine - ten	3&4_LS13	Multiplicative Reasoning 3 – Formal Written Multiplication and Division
Remaining weeks should be review and close the gap sessions focusing on high value learning – place value, mental and written fluency		

Term 3		
Week one - two	3&4_LS14	Number and Place Value Reasoning 2 – Decimals
Week three	3&4_LS15	Measurement Reasoning 1 – Comparing, Estimating and Calculating with Measures
Week four - five	3&4_LS16	Measurement and Statistical Reasoning 2 – Time, Timetables and Time Graphs
Week six - eight	3&4_LS17	Operational Reasoning – Understanding and Applying the Four Operations
Week nine	3&4_LS18	Proportional Reasoning 3 – Finding Fractions of Continuous Quantities
Week ten - twelve	3&4_LS19	Rolling Topics (see guidance) *First year:* • Roman Numerals to 100 (4LS28) • 3-D Shape – Building and Identifying Properties (3LS39) • Symmetry (4LS15) *Second year:* • Negative Numbers – Counting through Zero and Calculating in Context (4LS29) • Geometry – Coordinates in the First Quadrant and Translations (4LS32) • Geometry – Position and Direction, Incorporating Angles and Plotting Points of a Shape (4LS33)
Remaining weeks should be review and close the gap sessions focusing on high value learning – place value, mental and written fluency		

Year 5 and 6

Term 1		
Week one - two	5&6_LS1	Number and Place Value Reasoning
Week three	5&6_LS2	Multiplicative Reasoning 1 (Multiply and Divide by Powers of Ten)
Week four	5&6_LS3	Additive Reasoning 1
Week five	5&6_LS4	Number Properties Reasoning
Week six - seven	5&6_LS5	Multiplicative Reasoning 2 (Multiplication)
Week eight - nine	5&6_LS6	Fraction Reasoning 1
Week ten	5&6_LS7	Multiplicative Reasoning 3 (Division)
Week eleven - twelve	5&6_LS8	Algebraic Reasoning 1

Term 2		
Week one	5&6_LS9	Geometric Reasoning 1
Week two - three	5&6_LS10	Proportional Reasoning 1 (Percentages)
Week four	5&6_LS11	Multiplicative Reasoning 4 (Division)
Week five	5&6_LS12	Spatial Reasoning 1 (Area and Perimeter)
Week six	5&6_LS13	Fraction Reasoning 2 (Multiplying and Dividing with Fractions)
Week seven	5&6_LS14	Spatial Reasoning 2 (Volume)
Week eight	5&6_LS15	Proportional Reasoning 2 (Ratio and Scaling)
Week nine - ten	5&6_LS16	Positional Reasoning (Angles and Translation)

Term 3		
Before SATs	5&6_LS17	Statistical Reasoning 1
Before SATs	5&6_LS18	Roman Numerals, Time and Revision
Post SATs	5&6_LS19	Proportional Reasoning 3
Post SATs	5&6_LS20	Statistical Reasoning 2
Post SATs	5&6_LS21	Measures and Describing Patterns
Post SATs	6LS35	Financial Maths and Enterprise – Y6 focus but could be used with both year groups
Post SATs	5LS35	Solving Problems involving the Four Operations – Y5 focus but could be used with both year groups
Post SATs	5&6_LS22	Transition and High Value Learning

Implementation

How are lessons taught?

The vision is that each lesson demonstrates the following features:

- A mental oral starter
- A date and learning objective and, where possible, a context to the lesson. Where does this fit in? How does it relate to maths outside the classroom?
- Modelling of the skill. Different representations, procedures and written methods shown (using concrete, pictorial and the abstract where necessary)
- Application through fluency with differentiation in task
- Application through problem solving and reasoning

Teachers can plan through annotation of Herts Essential planning or writing up on a new document.

Resources
Planning will be supported by the use of Herts Essential planning and various other resources deemed to be appropriate for the teaching and learning of a particular strand or topic. Where appropriate, Concrete, Pictorial and Abstract methods (CPA approach) will be used to enhance teaching and learning. This will help children deepen their understanding of the concepts being taught and enhance their learning experience. Teachers also use Herts Essential practise materials to support their teaching with activities provided for the children to work through.

Assessment
Formative assessment involving questioning, in the moment marking, observation, challenge and questioning will be used in every lesson. Once a week the class teacher will give the children a challenge, Green for Growth, question to respond to. Teachers will use the Herts Essential Diagnostic Tests for summative End of Term assessments. These tests give standardized scores and identify gaps in teaching and learning.

Monitoring
Maths will be monitored via 'Book Looks' and feedback, learning walks and observations, pupil voice and pupil progress meetings where progress and attainment will be discussed and next steps put into place.

Moderation
Bayford Primary School works closely with our three partner schools to share good practice, learn from each other and make financial savings through shared resources and joint procurement. The partnership provides opportunities for colleagues in different roles to collaborate, and while it is still in its early stages of development,

it is already proving to be of benefit to the children all four schools. Teachers also attend moderation meetings organised by Herts for Learning on a regular basis.

Staff Development
Coaching, Mentoring, team-teaching and peer observations and training courses. Working alongside the HIP on "deep dives" into the subject

Impact

Through discussion and feedback, children speak in detail using mathematical vocabulary about their lessons and will speak with enthusiasm about their love of learning in Maths. They are starting to be able to link their Maths teaching to real life purposes and are eager to show work they have enjoyed and will describe the concepts covered and their knowledge and skills in Maths.
Pupils are able to discuss different methods they can use to explain their ideas and are able to apply the concepts taught to new problems in unfamiliar situations. Children are engaged during lessons and will be challenged or supported effectively to meet their full potential.
Pupils are starting to show a high level of pride in their presentation and understanding of their work, keeping one digit per square within their book. They have the change to make connections with Maths and different areas of the curriculum and will have opportunities to use Maths inside and outside of school. Children are supported to reach age related expectations at the end of the year and interventions are put in place to support those who may be struggling. Children are reasoning with increased confidence and accuracy.