Why is Maths important at Bredbury St Marks?

Maths is used far more often on a daily basis by everyone than we often realise.

There isn't a day that goes by when you won't use maths in one way or another.

For example, when cooking you may need to double or halve a recipe. When out shopping you will use maths to work out the best bargains on offer. When we need to get somewhere we might be working out how far it is and then estimating the time it will take to get there, and using our time-telling skills to figure out what time to leave the house to get there on time. If you are doing some DIY around the house you may be measuring walls, working out how many rolls of wallpaper to buy and working out the total cost as you go. Every pay day you know how much your take home pay is, and you know how much your bills will cost and how much disposable income and savings you have.

In summary, the number of ways we use maths in our everyday lives is almost endless!

Maths is also all around us in ways we cannot see. You can guarantee that any technology we use is utilising maths to work out both calculations (cash machines, self-service tills) and also as part of the programming and algorithms it uses to work – and also to target you for relevant advertising, in the case of social media.

We also use maths to save our lives if we need a certain dose of medication or to work out how often to take our tablets. And our brains even do some really fast calculations to work out when it is safe to cross the road.

Even without using mathematics in our jobs we are surrounded by it, and you can see from just a few of the examples above that a low numeracy level may affect multiple aspects of your life.

People who have not had the chance to practice their numeracy skills early on in life find many of these things tricky and this can result in, at best, missing out on a few bargains, and, at worst, missing out on jobs and other opportunities which impact on their whole lives.

The best way to ensure good mathematical skill and understanding in adults is repetition and opportunities to practice starting from a very young age. Therefore, at Bredbury St Marks, Maths is taught daily.

We know that low numeracy levels in children at school usually equates to low numeracy skills in adulthood and this contributes to a number of factors affecting lives – from unemployment to health implications. On top of that there are, of course, careers where maths is incredibly useful and often necessary.

How is Maths taught at Bredbury St Marks?

The teaching of mathematics at Bredbury St Mark's reflects the main aims of the Maths Curriculum.

It is evident that there is a focus on:

- **Mental recall of number facts**
- **Fluency and efficiency** of methods used
- **Reasoning and communicating understanding**

It is evident that the **depth of understanding** is more important than coverage.

Children are encouraged to:

- Recall number facts
- Apply their knowledge of number facts
- Make decisions about the most efficient methods to use
- Explain their reasoning
- Articulate how they have completed a calculation

At Bredbury St Mark's, we adopt a maths scheme called ***Power Maths*** to support our teaching of maths.

What is Power Maths?

Power Maths is a resource that has been designed for UK schools based on research and extensive experience of teaching and learning around the world and here in the UK. Power Maths is a whole-class, textbook-based mastery resource that empowers every child to understand and succeed. Power Maths rejects the notion that some people simply 'can't' do maths. Instead, it develops growth mindsets and encourages hard work, practice and a willingness to see mistakes as learning tools. It has been designed to support and challenge all pupils, and is built on the belief that EVERYONE can learn maths successfully.

Philosophy

The philosophy behind *Power Maths* is that being successful in maths is not just about rote-learning procedures and methods, but is instead about problem solving, thinking and discussing. *Power Maths* includes practice questions to help children develop fluent recall and develop their conceptual understanding. *Power Maths* uses growth mindset characters to prompt, encourage and question children. They spark curiosity, engage reasoning, secure understanding and deepen learning for all.

Meet the team!

Flexible Flo is open-minded and sometimes indecisive. She likes to think differently and come up with a variety of methods or ideas.

'Let's try again.'

'Mistakes are cool!'

'Have I found all of the solutions?'

'Let's try it this way ...'

'Can we do it differently?'

'I've got another way of doing this!'

'I'm going to try this!'

'I know how to do that!'

'Want to share my ideas?'

Brave Astrid is confident, willing to take risks and unafraid of failure. She is never scared to jump straight into a problem or question, and although she often makes simple mistakes she is happy to talk them through with others.

Determined Dexter is resolute, resilient and systematic. He concentrates hard, always tries his best and he'll never give up – even though he doesn't always choose the most efficient methods!

Curious Ash is eager, interested and inquisitive, and he loves solving puzzles and problems. Ash asks lots of questions but sometimes gets distracted.

'What if we tried this ...?'

'I wonder ...'

'Is there a pattern here?'

Miaow!

Sparks the Cat

Unit Structure

Each unit begins with a unit starter, which introduces the learning context along with key mathematical vocabulary, structures and representations. A series of lessons are then scaffolded with Textbook and Practice Book activities. At the end of a unit, there is an end of unit summative assessment task which reveals which children have mastered the key concepts, which children have not and where their misconceptions lie.

Lesson Structure

Each lesson has a progression, with a central flow that draws the main learning into focus. There are different elements:

- **Power up** – each lesson begins with a power up activity which supports fluency in number facts
- **Discover** – the main teaching begins with a problem to solve, often a real-life example, sometimes a puzzle or a game. These are engaging and fun, and designed to get all children thinking.
- **Share** – the class shares their ideas and compares different ways to solve the problem, explaining their reasoning with hands-on resources and drawings to make their ideas clear. Children are able to develop their understanding of the concept with input from the teacher.
- **Think together** – the next part of the lesson is a journey through the concept, digging deeper and deeper so that each child builds on secure foundations while being challenged to apply their understanding in different ways and with increasing independence.
- **Practice** – now children practice individually or in small groups, rehearsing and developing their skills to build fluency, understanding of the concept and confidence.
- **Reflect** – finally, children are prompted to reflect on and record their learning from each session and show how they have grasped the concept explored in the lesson.

Example of lesson progression below.

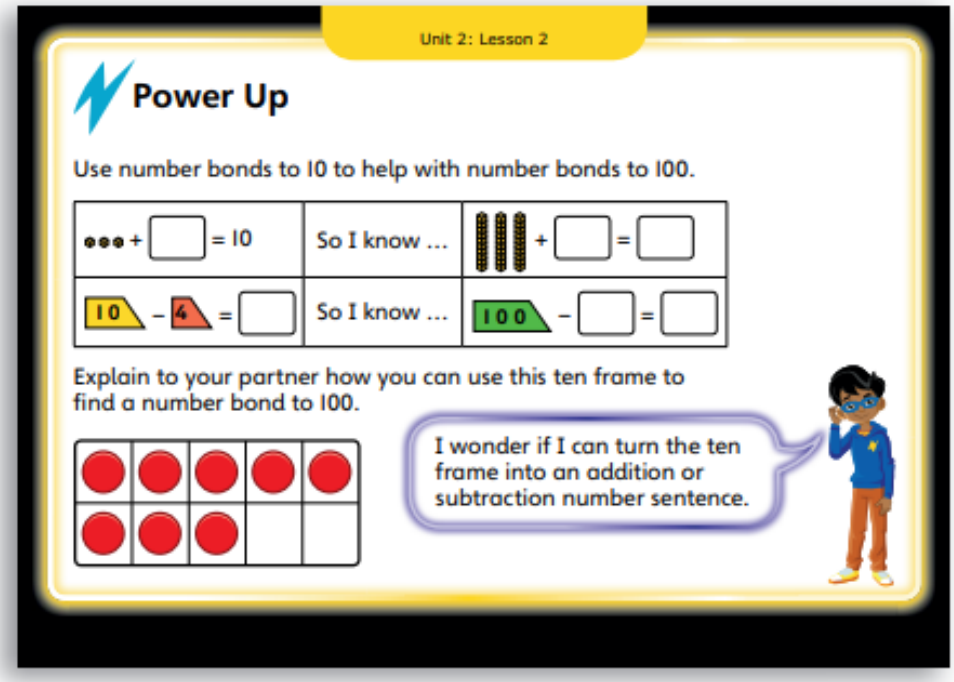
Power Up 5 minutes

Each lesson begins with a Power Up activity (available via the online subscription) which supports fluency in key number facts.

The whole-class approach depends on fluency, so the Power Up is a powerful and essential activity.

TOP TIP
If the class is struggling with the task, revisit it later and check understanding.

Power Ups reinforce key skills such as times-tables, number bonds and working with place value.



Discover 10 minutes

A practical, real-life problem arouses curiosity. Children find the maths through story-telling.

A real-life scenario is provided for the Discover section but feel free to build upon these with your own examples that are more relevant to your class.

TOP TIP

Discover works best when run at tables, in pairs with concrete objects.

Question 1 a) tackles the key concept and question 1 b) digs a little deeper. Children have time to explore, play and discuss possible strategies.

Unit 4: Multiplication and division (1), Lesson 13

Understanding divisibility 1

Discover

1 a) Lexi and Zac are using lollipop sticks to make squares.
How many squares can they make?
How many lollipop sticks are left over?

b) How would the answer change if they had 14 lollipop sticks?
What about 15, 16 or 17 lollipop sticks?

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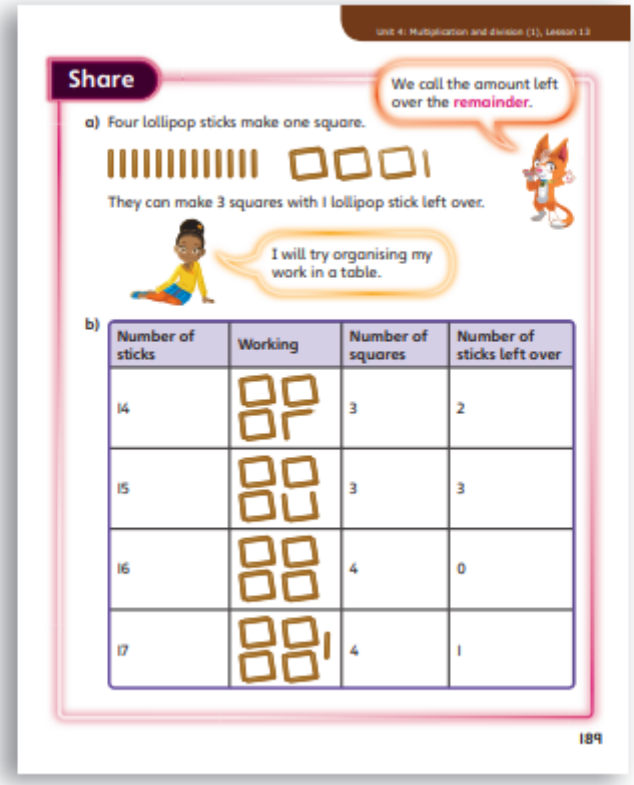
Share 10 minutes

Teacher-led, this interactive section follows the Discover activity and highlights the variety of methods that can be used to solve a single problem.

TOP TIP

Bring children to the front (or onto the carpet if you have this area) to discuss their methods. Pairs sharing a textbook is a great format for this!



Unit 4: Multiplication and division (1), Lesson 13

Share

a) Four lollipop sticks make one square.

They can make 3 squares with 1 lollipop stick left over.

b)

Number of sticks	Working	Number of squares	Number of sticks left over
14		3	2
15		3	3
16		4	0
17		4	1

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Your Teacher Guide gives target questions for children. The online toolkit provides interactive structures and representations to link concrete and pictorial to abstract concepts.

TOP TIP

Bring children to the front to share and celebrate their solutions and strategies.

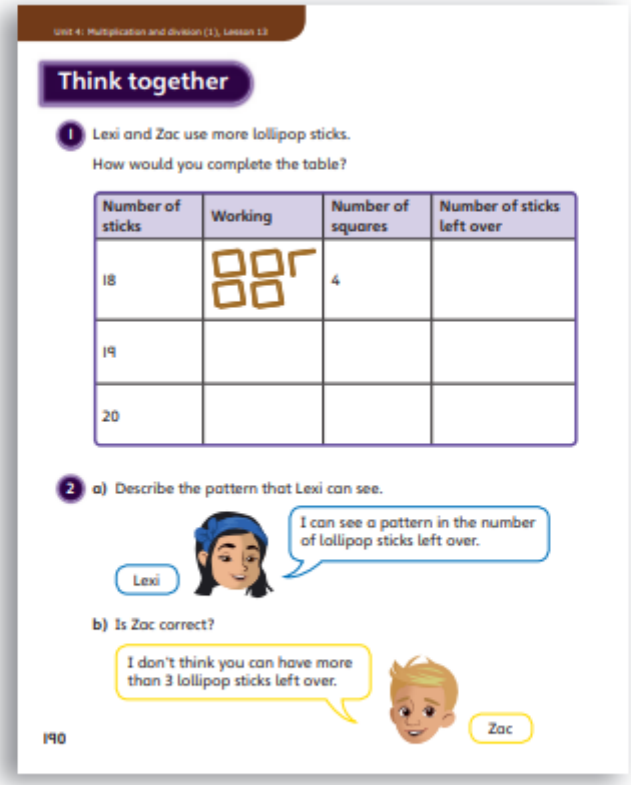
Think together

10 minutes

Children work in groups on the carpet or at tables, using their textbooks or eBooks.

TOP TIP

Make sure children have mini whiteboards or pads to write on if they are not at their tables.



Unit 4: Multiplication and division (1), Lesson 13

Think together

1 Lexi and Zac use more lollipop sticks.

How would you complete the table?

Number of sticks	Working	Number of squares	Number of sticks left over
18		4	
19			
20			

2 a) Describe the pattern that Lexi can see.

Lexi: I can see a pattern in the number of lollipop sticks left over.

b) Is Zac correct?

Zac: I don't think you can have more than 3 lollipop sticks left over.

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Using the Teacher Guide, model question 1 for your class.

Question 2 is less structured. Children will need to think together in their groups, then discuss their methods and solutions as a class.

In questions 3 and 4 children try working out the answer independently. The openness of the challenge question helps to check depth of understanding.

Practice

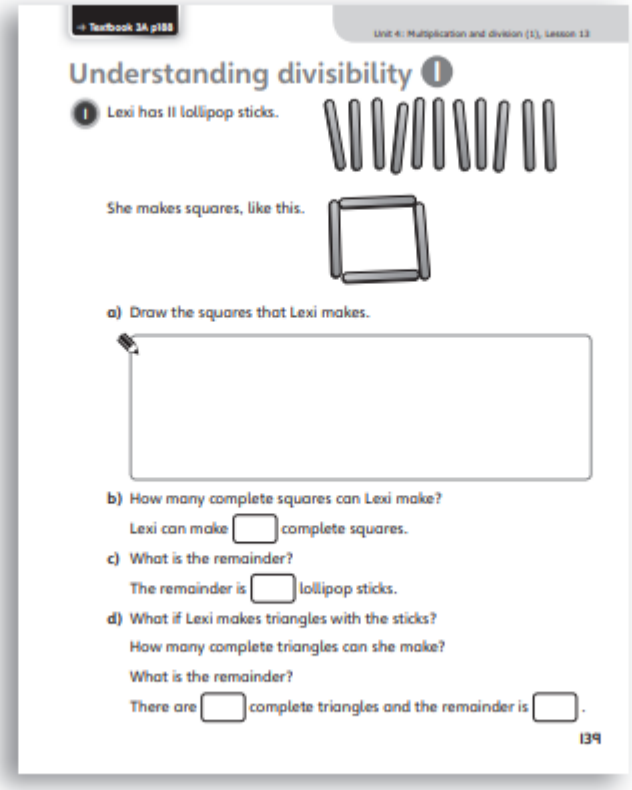
15 minutes

Using their Practice Books, children work independently while you circulate and check on progress.

Questions follow small steps of progression to deepen learning.

TOP TIP

Some children could work separately with a teacher or assistant.



→ Textbook 3A p188

Unit 4: Multiplication and division (1), Lesson 13

Understanding divisibility 1

1 Lexi has 11 lollipop sticks.

She makes squares, like this.

a) Draw the squares that Lexi makes.

b) How many complete squares can Lexi make?

Lexi can make ☐ complete squares.

c) What is the remainder?

The remainder is ☐ lollipop sticks.

d) What if Lexi makes triangles with the sticks?

How many complete triangles can she make?

What is the remainder?

There are ☐ complete triangles and the remainder is ☐.

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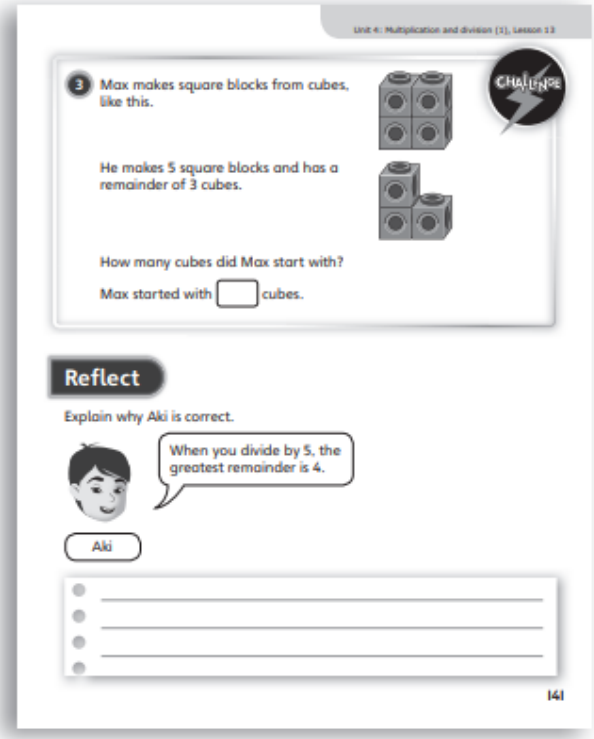
Are some children struggling? If so, work with them as a group, using mathematical structures and representations to support understanding as necessary.

There are no set routines: for real understanding, children need to think about the problem in different ways.

Reflect 5 minutes

'Spot the mistake' questions are great for checking misconceptions.

The Reflect section is your opportunity to check how deeply children understand the target concept.



The Practice Books use various approaches to check that children have fully understood each concept.

Looking like they understand is not enough! It is essential that children can show they have grasped the concept.

Power Maths is based on a 'small-steps' approach, which means that the concepts are broken down. There are a range of fluency, reasoning and problem solving questions in each lesson that are designed to support the different needs and confidence levels within a class, while at the same time fostering a spirit of working and learning together. Each lesson includes a challenge question for those children who can delve deeper into a concept.

Children have access to resources such as counters, tens and ones, multilink and place value counters at all times to support their mathematical thinking when necessary.

Progression of Knowledge and Concepts

The Power Maths planning divides the curriculum into three parts – Term 1, Term 2 and Term 3 (or Books A, B and C). The tables below show the curriculum at a glance, and illustrate the sequence in which concepts are taught and then revisited.

Reception

Autumn term

Strand	Unit		Week	Week title	Early Learning Goal
Number – number and place value	Unit 1	Numbers to 5	1	Counting to 1, 2 and 3	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Recognise the pattern of the counting system.
			2	Counting to 4	
			3	Counting to 5	
Number – number and place value	Unit 2	Comparing groups within 5	4	Comparing quantities of identical objects	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. Subitise (recognise quantities without counting) up to 5.
			5	Comparing quantities of non-identical objects	
Geometry – properties of shape	Unit 3	Shape	6	3D shapes	*There is no specific ELG related to this unit. This unit supports the Development Matters statement Select, rotate and manipulate shapes in order to develop spatial reasoning.*
			7	2D shapes	
Number – addition and subtraction	Unit 4	Change within 5	8	One more	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
			9	One less	
Number – addition and subtraction	Unit 5	Number bonds within 5	10	Introducing the part-whole model	Have a deep understanding of number to 10, including the composition of each number. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.
Geometry – properties of shape	Unit 6	Space	11	Spatial awareness	*There is no specific ELG related to this unit. This unit supports the Development Matters statement Select, rotate and manipulate shapes in order to develop spatial reasoning skills.*

Spring term

Strand	Unit		Week	Week title	Early Learning Goal
Number – number and place value	Unit 7	Numbers to 10	1	Counting to 6, 7 and 8	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Verbally count, (recognising the pattern of the counting system).
			2	Counting to 9 and 10	
Number – number and place value	Unit 8	Comparing numbers within 10	3	Comparing groups up to 10	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Compare quantities up to 10 in different contexts, (recognising when one quantity is greater than, less than or the same as the other quantity).
Number – addition and subtraction	Unit 9	Addition to 10	4	Combining 2 groups to find the whole	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.

Strand	Unit		Week	Week title	Early Learning Goal
Number – number and place value	Unit 10	Measure	5	Length, height and distance	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
			6	Weight	
Number – addition and subtraction	Unit 11	Number bonds to 10	7	Using a ten frame	Have a deep understanding,of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
			8	The part-whole model to 10	
Number – addition and subtraction	Unit 12	Subtraction	9	Subtraction	Have a deep understanding of number to 10, including the composition of each number.
Geometry – properties of shape	Unit 13	Exploring patterns	10	Making simple patterns	*There is no specific ELG related to this unit. This unit supports the Development Matters statement Continue, copy and create repeating patterns.*
			11	Exploring more complex patterns	

Summer term

Strand	Unit		Week	Week title	Early Learning Goal
Number – addition and subtraction	Unit 14	Counting on and counting back	1	Adding by counting on	Have a deep understanding of number to 10, including the composition of each number.
			2	Taking away by counting back	
Number – number and place value	Unit 15	Numbers to 20	3	Counting to and from 20	Verbally count beyond 20, recognising the pattern of the counting system.
Number – multiplication and division	Unit 16	Numerical patterns	4	Doubling	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
			5	Halving and sharing	
			6	Odds and evens	
Geometry – properties of shape	Unit 17	Shape	7	Composing and decomposing shapes	*There is no specific ELG related to this unit. This unit supports the Development Matters statement Select, rotate and manipulate shapes in order to develop spatial reasoning.*
Number – number and place value	Unit 18	Measure	8	Volume and capacity	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
Number – addition and subtraction	Unit 19 (Optional)	Sorting	9	Sorting into 2 groups	*This unit is optional because sorting is not covered in the EYFS Framework or Development Matters guidance for Reception. It does provide an introduction to the concept of sorting, which will be useful in Year 1.*
Measurement	Unit 20 (Optional)	Time	10	My day	*This unit is optional because time is not covered in the EYFS Framework or Development Matters guidance for Reception. It does provide a useful introduction to time, which will be covered in Year 1.*

Year 1

Textbook	Strand	Unit	Number of Lessons	
Textbook A / Practice Pupil Book A (Term 1)	Number – number and place value	1	Numbers to 10	12
	Number – number and place value	2	Part-whole within 10	5
	Number – addition and subtraction	3	Addition and subtraction within 10 (1)	6
	Number – addition and subtraction	4	Addition and subtraction within 10 (2)	12
	Geometry – properties of shape	5	2D and 3D shapes	5
	Number – number and place value	6	Numbers to 20	7
Textbook B / Practice Pupil Book B (Term 2)	Number – addition and subtraction	7	Addition within 20	6
	Number – addition and subtraction	8	Subtraction within 20	8
	Number – number and place value	9	Numbers to 50	11
	Measurement	10	Introducing length and height	5
	Measurement	11	Introducing weight and volume	7
Textbook C / Practice Pupil Book C (Term 3)	Number – multiplication and division	12	Multiplication	6
	Number – multiplication and division	13	Division	5
	Number – fractions	14	Halves and quarters	5
	Geometry – position and direction	15	Position and direction	3
	Number – number and place value	16	Numbers to 100	9
	Measurement	17	Time	7
	Measurement	18	Money	3

Year 2

Textbook	Strand	Unit	Number of Lessons	
Textbook A / Practice Workbook A (Term 1)	Number – number and place value	1	Numbers to 100	10
	Number – addition and subtraction	2	Addition and subtraction (1)	12
	Number – addition and subtraction	3	Addition and subtraction (2)	9
	Measurement	4	Money	9
	Number – multiplication and division	5	Multiplication and division (1)	9
Textbook B / Practice Workbook B (Term 2)	Number – multiplication and division	6	Multiplication and division (2)	9
	Statistics	7	Statistics	7
	Measurement	8	Length and height	5
	Geometry – properties of shape	9	Properties of shapes	12
	Number – fractions	10	Fractions	14
Textbook C / Practice Workbook C (Term 3)	Geometry – position and direction	11	Position and direction	4
	Number – addition and subtraction	12	Problem solving and efficient methods	12
	Measurement	13	Time	9
	Measurement	14	Weight, volume and temperature	10

Year 3

Textbook	Strand	Unit		Number of Lessons
Textbook A / Practice Book A (Term 1)	Number – number and place value	1	Place value within 1,000	11
	Number – addition and subtraction	2	Addition and subtraction (1)	10
	Number – addition and subtraction	3	Addition and subtraction (2)	9
	Number – multiplication and division	4	Multiplication and division (1)	15
Textbook B / Practice Book B (Term 2)	Number – multiplication and division	5	Multiplication and division (2)	14
	Measurement	6	Money	5
	Statistics	7	Statistics	5
	Measurement	8	Length	11
	Number – fractions	9	Fractions (1)	11
Textbook C / Practice Book C (Term 3)	Number – fractions	10	Fractions (2)	9
	Measurement	11	Time	11
	Geometry – properties of shapes	12	Angles and properties of shapes	9
	Measurement	13	Mass	6
	Measurement	14	Capacity	6

Year 4

Textbook	Strand	Unit		Number of Lessons
Textbook A / Practice Book A (Term 1)	Number – number and place value	1	Place value – 4-digit numbers (1)	9
	Number – number and place value	2	Place value – 4-digit numbers (2)	9
	Number – addition and subtraction	3	Addition and subtraction	15
	Measurement	4	Measure – perimeter	5
	Number – multiplication and division	5	Multiplication and division (1)	11
Textbook B / Practice Book B (Term 2)	Number – multiplication and division	6	Multiplication and division (2)	15
	Measurement	7	Measure – area	5
	Number – fractions (including decimals)	8	Fractions (1)	7
	Number – fractions (including decimals)	9	Fractions (2)	8
	Number – fractions (including decimals)	10	Decimals (1)	10
Textbook C / Practice Book C (Term 3)	Number – fractions (including decimals)	11	Decimals (2)	7
	Measurement	12	Money	9
	Measurement	13	Time	5
	Statistics	14	Statistics	5
	Geometry – properties of shapes	15	Geometry – angles and 2D shapes	10
	Geometry – position and direction	16	Geometry – position and direction	6

Year 5

Textbook	Strand	Unit		Number of Lessons
Textbook A / Practice Book A (Term 1)	Number – number and place value	1	Place value within 100,000	8
	Number – number and place value	2	Place value within 1,000,000	8
	Number – addition and subtraction	3	Addition and subtraction	10
	Statistics	4	Graphs and tables	5
	Number – multiplication and division	5	Multiplication and division (1)	10
	Measurement	6	Measure – area and perimeter	7
Textbook B / Practice Book B (Term 2)	Number – multiplication and division	7	Multiplication and division (2)	11
	Number – fractions (including decimals and percentages)	8	Fractions (1)	8
	Number – fractions (including decimals and percentages)	9	Fractions (2)	12
	Number – fractions (including decimals and percentages)	10	Fractions (3)	7
	Number – fractions (including decimals and percentages)	11	Decimals and percentages	12
Textbook C / Practice Book C (Term 3)	Number – fractions (including decimals and percentages)	12	Decimals	15
	Geometry – properties of shapes	13	Geometry – properties of shapes (1)	7
	Geometry – properties of shapes	14	Geometry – properties of shapes (2)	5
	Geometry – position and direction	15	Geometry – position and direction	4
	Measurement	16	Measure – converting units	10
	Measurement	17	Measure – volume and capacity	4

Year 6

Textbook	Strand	Unit		Number of Lessons
Textbook A / Practice Book A (Term 1)	Number – number and place value	1	Place value within 10,000,000	7
	Number – addition, subtraction, multiplication and division	2	Four operations (1)	10
	Number – addition, subtraction, multiplication and division	2	Four operations (2)	9
	Number – fractions	4	Fractions (1)	11
	Number – fractions	5	Fractions (2)	9
	Geometry – position and direction	6	Geometry – position and direction	4
Textbook B / Practice Book B (Term 2)	Number – fractions (including decimals and percentages)	7	Decimals	9
	Number – fractions (including decimals and percentages)	8	Percentages	9
	Algebra	9	Algebra	11
	Measurement	10	Measure – imperial and metric measures	5
	Measurement	11	Measure – perimeter, area and volume	11
	Ratio and proportion	12	Ratio and proportion	9
Textbook C / Practice Book C (Term 3)	Geometry – properties of shapes	13	Geometry – properties of shapes	12
	Number – number and place value	14	Problem solving	14
	Statistics	15	Statistics	10

Further detail regarding the progression from one year group to the next can be found in the year group Long Term Plans (See Appendixes 1 – 7).

Progression in Calculation Methods

An outline of the methods used for each operation (broadly determined by Key Stage) is detailed in the *Power Maths Calculation Policy (See Appendixes 8 – 11).*

Teaching Recall of Number Facts

At Bredbury St Marks all classes have two explicitly taught recall of facts sessions each week which focus on teaching number bonds and multiplication/division facts.

Children access Numbots and Times Tables Rock Stars regularly, an online programme designed to help children master their number bonds and times tables by recalling them at speed.

Assessment

Formative Assessment

Formative assessment within lessons ensures that teachers are confident about what each child knows and where their misconceptions lie.

The Think together section will often reveal any confusions or insecurities. Adults can then provide support and enable children to move on.

Performance in Practice can be very informative, and so checking Practice Books and listening to responses both during and after practice can support with identifying misconceptions.

The Reflect section checks the depth of children's understanding.

Summative Assessment

Each unit concludes with a summative check to support with quick and clear assessment of each child's understanding, fluency, reasoning and problem-solving skills. In KS2 these checks also contains a SATs-style question to help children become familiar with answering this type of question.

Half termly tests are also used to support teacher's assessment (Power Maths Progress Tests, NFER and previous SATs papers).

SEND

The Power Maths' mastery approach values real understanding and richer, deeper learning. It advocates all children learning the same concept in small, cumulative steps, each finding and mastering challenge at their own level. Therefore, children with additional needs often access the same input as their peers, supported by the use of concrete resources and guided by adults.

The Think together activity reveals those children who are struggling, so when it is time for Practice, teachers bring these children together to guide them through the first Practice questions. Through observing these children carefully, asking questions, and encouraging them to use concrete models, teachers can check that children can demonstrate their understanding.

The next lesson in a Power Maths sequence always revises and builds on the previous step to help embed learning. These activities provide golden opportunities for individual children to strengthen their learning with the support of their peers/adults.

In some instances, where children have significant gaps in their prior learning, possibly due to cognitive developmental delay, teachers may make the decision for them to access the Power Maths content from a previous year group. The lesson structure, including modelling and use of concrete resources, will follow the same format thus allowing them to make progress.