Brereton CE Primary School

THIS IS OUR SCHOOL

Maths in Year 5

Maths at Brereton

How do we teach Maths at Brereton?

At Brereton, we use Power Maths as a basis of our maths lesson. This is an exciting class mastery approach, which has been recommended by the DfE, that works for every child. It is based upon the concrete, pictorial and abstract approach.

Every lesson is divided into sections that involve plenty of discovery, sharing, collaboration, practice and reflection. Children are encouraged to solve problems each day through the use of concrete resources, pictorial representations and abstract thinking.

At the heart of this programme is the idea that all children can achieve and be successful mathematicians with the right growth mindset.

What does a Power Maths

Power Up: Each lesson begins with a Power Up task. This is often something the children have been previously taught and encourages group or partner work. This involves lots of discussion to get children thinking mathematically.

Discover: This part of the lesson introduces the learning objective to the class. The children are presented with a problem they must try to solve using problem solving and reasoning.

Share: This is an opportunity to look at how the class have decided to tackle the Discover problem. As a class, we will look at different methods that have been used before looking at the most efficient method. At this point, it is encouraged to have learning aids out. This might include place value counters or Base 10. This is so that children can understand the concept behind the teaching.

Think together: This part of the lesson allows children to practice the methods they have been shown during the Share part of the lesson. It follows a structure of I do, We do, You do. The teacher models the method before the children try the method with a partner and on their own.

Independent work: The main part of the lesson consists of independent practice. The questions in the Power Maths workbook allow children the opportunity to work through problems related to the learning objective that become progressively harder.
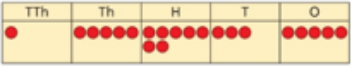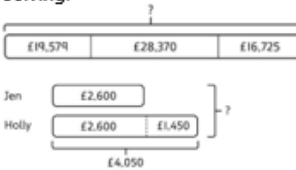
Reflect: Each lesson ends with a reflection. This is an opportunity for children to explain what they have learnt during the lesson.
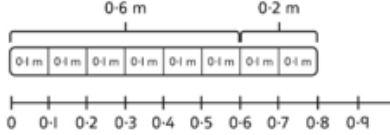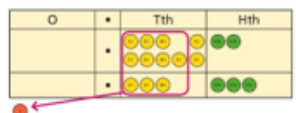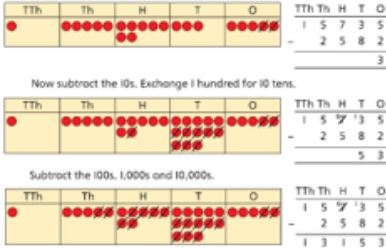
Addition

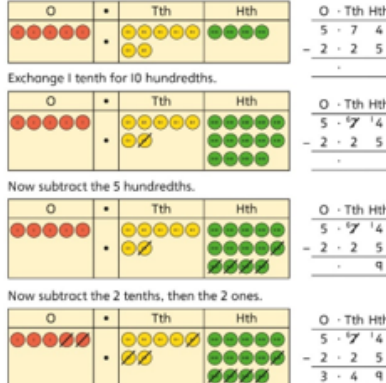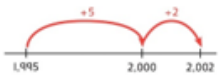|			

Column addition with whole numbers	Use place value equipment to represent additions.
	
	Add a row of counters onto the place value grid to show 15,735 + 4,012.
	
	TTh | Th | H | T | O
		Represent additions, using place value equipment on a place value grid alongside written methods.
		
		TTh | Th | H | T | O
		
		I need to exchange 10 tens for a 100.
		
		TTh Th H T O
		  2 0 1 5 3
		+ 1 9 1 7 5
		  3 9 3 2 8
			Use column addition, including exchanges.
			
			TTh Th H T O
			  1 9 1 7 5
			+ 1 8 4 1 7
			  3 7 5 9 2

Representing additions		Bar models represent addition of two or more numbers in the context of problem solving.
		
		?
		£19,579 | £28,370 | £16,725
		
		Jen £2,600
		Holly £2,600 £1,450
		£4,050
		
		Th H T O
		2 6 0 0
		+ 1 4 5 0
		4 0 5 0
		
		Th H T O
		2 6 0 0
		+ 4 0 5 0
		6 6 5 0
			Use approximation to check whether answers are reasonable.
			
			TTh Th H T O TTh Th H T O
			  2 3 4 0 5 2 3 4 0 5
			+ 7 8 9 2 + 7 8 9 2
			  2 0 2 9 7 3 1 2 9 7
			
			I will use 23,000 + 8,000 to check.
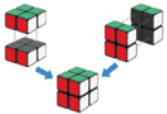
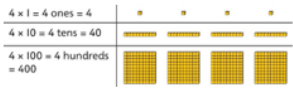|			
Adding tenths	Link measure with addition of decimals. *Two lengths of fencing are 0·6 m and 0·2 m.* *How long are they when added together?* 0·6 m 0·2 m	Use a bar model with a number line to add tenths. 0·6 m 0·2 m 0·1m |0·1m|0·1m|0·1m|0·1m|0·1m|0·1m|0·1m 0 0·1 0·2 0·3 0·4 0·5 0·6 0·7 0·8 0·9 1 $0·6 + 0·2 = 0·8$ *6 tenths + 2 tenths = 8 tenths*	Understand the link with adding fractions. $\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$ *6 tenths + 2 tenths = 8 tenths* *0·6 + 0·2 = 0·8*
Adding decimals using column addition	Use place value equipment to represent additions. *Show 0·23 + 0·45 using place value counters.*	Use place value equipment on a place value grid to represent additions. Represent exchange where necessary. O | • | Tth | Hth O · Tth Hth 0 · 9 2 + 0 · 3 3 1 · 2 5 Include examples where the numbers of decimal places are different. O | • | Tth | Hth O · Tth Hth 5 · 0 0 + 1 · 2 5 6 · 2 5	Add using a column method, ensuring that children understand the link with place value. O · Tth Hth 0 · 2 3 + 0 · 4 5 0 · 6 8 Include exchange where required, alongside an understanding of place value. O · Tth Hth 0 · 9 2 + 0 · 3 3 1 · 2 5 Include additions where the numbers of decimal places are different. $3.4 + 0.65 = ?$ O · Tth Hth 3 · 4 0 + 0 · 6 5

Subtraction

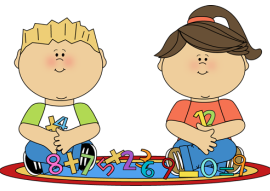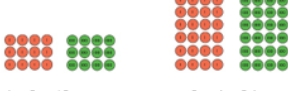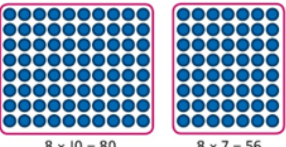|			
Column subtraction with whole numbers	Use place value equipment to understand where exchanges are required. $2,250 - 1,070$ 	Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required. $15,735 - 2,582 = 13,153$ 	Use column subtraction methods with exchange where required. $62,097 - 18,534 = 43,563$
Checking strategies and representing subtractions		Bar models represent subtractions in problem contexts, including 'find the difference'. 	Children can explain the mistake made when the columns have not been ordered correctly. Use approximation to check calculations. *I calculated 18,000 + 4,000 mentally to check my subtraction.*

Choosing efficient methods			To subtract two large numbers that are close, children find the difference by counting on. $2,002 - 1,995 = ?$ Use addition to check subtractions. *I calculated 7,546 - 2,355 = 5,191.* *I will check using the inverse.*
Subtracting decimals	Explore complements to a whole number by working in the context of length. $1\,m - \square\,m = \square\,m$ $1 - 0\cdot49 = ?$	Use a place value grid to represent the stages of column subtraction, including exchanges where required. $5\cdot74 - 2\cdot25 = ?$ 	Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places. $3\cdot921 - 3\cdot75 = ?$

Multiplication

Understanding factors	Use cubes or counters to explore the meaning of 'square numbers'.	Use images to explore examples and non-examples of square numbers.	Understand the pattern of square numbers in the multiplication tables.
	25 is a square number because it is made from 5 rows of 5.	$8 \times 8 = 64$ $8^2 = 64$	Use a multiplication grid to circle each square number. Can children spot a pattern?
	Use cubes to explore cube numbers.		
	8 is a cube number.	*12 is not a square number, because you cannot multiply a whole number by itself to make 12.*	
Multiplying by 10, 100 and 1,000	Use place value equipment to multiply by 10, 100 and 1,000 by unitising.	Understand the effect of repeated multiplication by 10.	Understand how exchange relates to the digits when multiplying by 10, 100 and 1,000.
	$4 \times 1 = 4$ ones $= 4$ $4 \times 10 = 4$ tens $= 40$ $4 \times 100 = 4$ hundreds $= 400$		$17 \times 10 = 170$ $17 \times 100 = 17 \times 10 \times 10 = 1,700$ $17 \times 1,000 = 17 \times 10 \times 10 \times 10 = 17,000$

Multiplying by multiples of 10, 100 and 1,000	Use place value equipment to explore multiplying by unitising.	Use place value equipment to represent how to multiply by multiples of 10, 100 and 1,000.	Use known facts and unitising to multiply.
	5 groups of 3 ones is 15 ones. *5 groups of 3 tens is 15 tens.* *So, I know that 5 groups of 3 thousands would be 15 thousands.*	$4 \times 3 = 12$ $4 \times 300 = 1,200$ $6 \times 4 = 24$ $6 \times 400 = 2,400$	$5 \times 4 = 20$ $5 \times 40 = 200$ $5 \times 400 = 2,000$ $5 \times 4,000 = 20,000$ $5,000 \times 4 = 20,000$
Multiplying up to 4-digit numbers by a single digit	Explore how to use partitioning to multiply efficiently. $8 \times 17 = ?$	Represent multiplications using place value equipment and add the 1s, then 10s, then 100s, then 1,000s.	Use an area model and then add the parts. 	100	60	3	 	5	$100 \times 5 = 500$	$60 \times 5 = 300$	$3 \times 5 = 15$	 Use a column multiplication, including any required exchanges.
	$8 \times 10 = 80$ $8 \times 7 = 56$ $80 + 56 = 136$ *So, $8 \times 17 = 136$*		
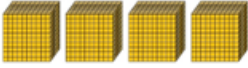
Multiplying 2-digit numbers by 2-digit numbers	Partition one number into 10s and 1s, then add the parts. $23 \times 15 = ?$	Use an area model and add the parts. $28 \times 15 = ?$	Use column multiplication, ensuring understanding of place value at each stage.
	$10 \times 15 = 150$ $10 \times 15 = 150$ $3 \times 15 = 45$ There are 345 bottles of milk in total. $23 \times 15 = 345$		20 m	8 m	 	10 m	$20 \times 10 = 200$ m²	$8 \times 10 = 80$ m²	 	5 m	$20 \times 5 = 100$ m²	$8 \times 5 = 40$ m²	 $28 \times 15 = 420$	34×7, 34×20, 34×27 column multiplications
Multiplying up to 4-digits by 2-digits		Use the area model then add the parts. 	100	40	3	 	10				 	2				 $143 \times 12 = 1,716$ There are 1,716 boxes of cereal in total. $143 \times 12 = 1,716$	Use column multiplication, ensuring understanding of place value at each stage. 143×2, 143×10, 143×12 Progress to include examples that require multiple exchanges as understanding, confidence and fluency build.

Multiplication Continued

Multiplying decimals by 10, 100 and 1,000	Use place value equipment to explore and understand the exchange of 10 tenths, 10 hundredths or 10 thousandths.	Represent multiplication by 10 as exchange on a place value grid.	Understand how this exchange is represented on a place value chart.
		 $0.14 \times 10 = 1.4$	$2.5 \times 10 = 25$ $2.5 \times 100 = 250$ $2.5 \times 1,000 = 2,500$

Division

Understanding factors and prime numbers	Use equipment to explore the factors of a given number.	Understand that prime numbers are numbers with exactly two factors.	Understand how to recognise prime and composite numbers.
	 $24 \div 3 = 8$ $24 \div 8 = 3$ 8 and 3 are factors of 24 because they divide 24 exactly. $24 \div 5 = 4$ remainder 4. 5 is not a factor of 24 because there is a remainder.	$13 \div 1 = 13$ $13 \div 2 = 6\,r\,1$ $13 \div 4 = 4\,r\,1$ 1 and 13 are the only factors of 13. 13 is a prime number.	*I know that 31 is a prime number because it can be divided by only 1 and itself without leaving a remainder.* *I know that 33 is not a prime number as it can be divided by 1, 3, 11 and 33.* *I know that 1 is not a prime number, as it has only 1 factor.*
Understanding inverse operations and the link with multiplication, grouping and sharing	Use equipment to group and share and to explore the calculations that are present. *I have 28 counters.* *I made 7 groups of 4. There are 28 in total.* *I have 28 in total. I shared them equally into 7 groups. There are 4 in each group.* *I have 28 in total. I made groups of 4. There are 7 equal groups.*	Represent multiplicative relationships and explore the families of division facts. $60 \div 4 = 15$ $60 \div 15 = 4$	Represent the different multiplicative relationships to solve problems requiring inverse operations. Understand missing number problems for division calculations and know how to solve them using inverse operations. $22 \div ? = 2$ $22 \div 2 = ?$ $? \div 2 = 22$ $? \div 22 = 2$

Dividing whole numbers by 10, 100 and 1,000	Use place value equipment to support unitising for division. $4,000 \div 1,000$ *4,000 is 4 thousands.* $4 \times 1,000 = 4,000$ So, $4,000 \div 1,000 = 4$	Use a bar model to support dividing by unitising. $380 \div 10 = 38$ *380 is 38 tens.* $38 \times 10 = 380$ $10 \times 38 = 380$ So, $380 \div 10 = 38$	Understand how and why the digits change on a place value grid when dividing by 10, 100 or 1,000. $3,200 \div 100 = ?$ 3,200 is 3 thousands and 2 hundreds. $200 \div 100 = 2$ $3,000 \div 100 = 30$ $3,200 \div 100 = 32$ *So, the digits will move two places to the right.*
Dividing by multiples of 10, 100 and 1,000	Use place value equipment to represent known facts and unitising. *15 ones put into groups of 3 ones. There are 5 groups.* $15 \div 3 = 5$ *15 tens put into groups of 3 tens. There are 5 groups.* $150 \div 30 = 5$	Represent related facts with place value equipment when dividing by unitising. *180 is 18 tens.* *18 tens divided into groups of 3 tens. There are 6 groups.* $180 \div 30 = 6$	Reason from known facts, based on understanding of unitising. Use knowledge of the inverse relationship to check. $3,000 \div 5 = 600$ $3,000 \div 50 = 60$ $3,000 \div 500 = 6$ $5 \times 600 = 3,000$ $50 \times 60 = 3,000$ $500 \times 6 = 3,000$

Dividing up to four digits by a single digit using short division	Explore grouping using place value equipment. $268 \div 2 = ?$ There is 1 group of 2 hundreds. There are 3 groups of 2 tens. There are 4 groups of 2 ones. $264 \div 2 = 134$	Use place value equipment on a place value grid alongside short division. The model uses grouping. A sharing model can also be used, although the model would need adapting. Lay out the problem as a short division. There is 1 group of 4 in 4 tens. There are 2 groups of 4 in 8 ones. Work with divisions that require exchange. 	Use short division for up to 4-digit numbers divided by a single digit. $$7 \overline{\smash{)}3\,{}^38\,{}^39\,{}^42}$$ quotient $0\,5\,5\,6$ $3{,}892 \div 7 = 556$ Use multiplication to check. $556 \times 7 = ?$ $6 \times 7 = 42$ $50 \times 7 = 350$ $500 \times 7 = 3500$ $3{,}500 + 350 + 42 = 3{,}892$
Understanding remainders	Understand remainders using concrete versions of a problem. 80 cakes divided into trays of 6. 80 cakes in total. They make 13 groups of 6, with 2 remaining.	Use short division and understand remainders as the last remaining 1s. 	In problem solving contexts, represent divisions including remainders with a bar model. $683 = 136 \times 5 + 3$ $683 \div 5 = 136 \, r \, 3$
Dividing decimals by 10, 100 and 1,000	Understand division by 10 using exchange. 2 ones are 20 tenths. 20 tenths divided by 10 is 2 tenths.	Represent division using exchange on a place value grid. 1·5 is 1 one and 5 tenths. This is equivalent to 10 tenths and 50 hundredths. 10 tenths divided by 10 is 1 tenth. 50 hundredths divided by 10 is 5 hundredths. 1·5 divided by 10 is 1 tenth and 5 hundredths. $1{\cdot}5 \div 10 = 0.15$	Understand the movement of digits on a place value grid. $0{\cdot}85 \div 10 = 0{\cdot}085$ $8{\cdot}5 \div 100 = 0{\cdot}085$
Understanding the relationship between fractions and division	Use sharing to explore the link between fractions and division. 1 whole shared between 3 people. Each person receives one-third. 	Use a bar model and other fraction representations to show the link between fractions and division. $1 \div 3 = \frac{1}{3}$	Use the link between division and fractions to calculate divisions. $5 \div 4 = \frac{5}{4} = 1\frac{1}{4}$ $11 \div 4 = \frac{11}{4} = 2\frac{3}{4}$

Year 5 Expectations:

- Count forwards and backward with positive and negative numbers through zero.
- Count forwards/backwards in steps of powers of 10 for any given number up to 1,000,000.
- Compare and order numbers up to 1,000,000.
- Compare and order numbers with 3 decimal places.
- Read Roman numerals to 1,000.
- Identify all multiples and factors, including finding all factor pairs.
- Use known tables to derive other number facts.
- Recall prime numbers up to 19.
- Recognise and use square numbers and cube numbers.
- Recognise place value of any number up to 1,000,000.
- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 or 100,000.
- Round decimals with 2 decimal places to nearest whole number and 1 decimal place.
- Add and subtract: o Numbers with more than 4-digits using formal written method.
- Use rounding to check answers.
- Multiply: 4-digits by 1-digit/ 2-digit
- Divide: Up to 4-digits by 1-digit
- Multiply and divide: Whole numbers & decimals by 10, 100 and 1,000
- Recognise and use thousandths.
- Recognise mixed numbers and improper fractions and convert from one to another.
- Multiply proper fractions and mixed numbers by whole numbers.
- Identify and write equivalent fractions.
- Solve time problems using timetables and converting between different units of time.

Maths is a passport to a world of career opportunities and primary maths is the foundation for this. The goal is developing "Number Sense" - a kind of "maths fluency" which involves applying mental arithmetic accurately and quickly - and intuitively knowing if answers feel right or wrong.

Helping your child with maths at home can be daunting, but most parents are a lot better at maths than they think they are. It's worth putting on a "have a go" attitude because the extra practice and one-to-one attention can have a big impact. Helping can be as easy as playing a board game or discussing maths with your child. Finally, and most importantly, don't forget to encourage your child. You don't always need to understand what your child is learning – showing an interest and encouraging always has a positive effect. Praise works best when it's for effort and not necessarily for being quick or getting top marks. Praising for effort encourages learners to try harder which promotes a good attitude to learning.