MIDDLETON PARISH CHURCH SCHOOL

'Excellence, Truth & Grace'

HOW CAN I HELP WITH MATHEMATICS IN YEAR 6?

Year 6 Mathematicians

Mathematics is an essential life skill. Developed across centuries, mathematics is key feature of many parts of the wider world from history to science, engineering to hospitality, retail and beyond. Most forms of employment require the use of mathematics in some form and it is necessary for financial literacy. With this in mind, it is essential that children are engaged in their mathematics learning and are able to see how it fits into the wider world and our every day lives. So what better place to do this than at home! It is essential that the learning which takes place at school is reinforced at home where possible so that children have as many opportunities as possible to secure their learning and remember more.

What can families do?

Maths skills can be developed at home by involving them in everyday activities such as baking, looking at the best supermarket deals or sharing out sweets equally. This also develops their problem solving and reasoning skills! Don't underestimate yourself, or the power you have as a parent getting involved in your child's learning.

- **Positive mindset is EVERYTHING!** You may find yourself from time to time saying 'I was never good at Maths.' Children will pick up and mirror this energy. We would advise parents and carers to use positive language such as 'It's fine to make mistakes, we all do' or 'It's ok that you find this tricky, let's look through it together.' Positivity can go a long way to improving their attitude towards Maths.
- **Use Maths talk every day.** This could be as simple as asking your child to count the chicken nuggets and asking them whether the number of nuggets is a prime number or not. You could further develop their knowledge by asking questions such as: if this is a composite number, what are the factor pairs?
-**Develop their memory skills.** It has been found that the younger generation have little need to memorise things such as phone numbers. Start off with something simple like memorising a phone number. Make a game out of it to help develop their memory skills. This will soon develop into memorising times tables, addition facts, subtraction facts and many other mathematical skills.
-**Play maths games together.** Games have always been a fun way to engage children in their learning and a great bonding tool between adults and their children. Simple counting games, or games linked to their current objective in Maths, can support the children in engaging in their learning and retaining what they have learned.
-**Numbers and shapes are EVERYWHERE.** Help your child to recognise that numbers and shapes are everywhere. Asking them what the shape of a sign is on a walk or what number they see on the sign can be really important in developing their knowledge of Maths in real life contexts. This could be developed further by asking questions such as: is this a squared number? If you divided that number by 1000, what number would you now have?

TT Rockstars!

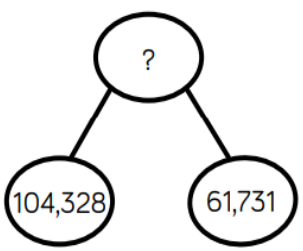
By the end of year 4 children are expected to rapidly and fluently recall multiplication and division facts for all of the times tables up to 12 x 12. To support this, we subscribe to Times Tables Rockstars to provide the children with a fun and engaging way of learning their tables facts. Each child has a login and there are a range of ways in which they can practise on the website. If your child is not secure in the recall of their times tables facts, they need to continue to practise as much as possible. We would expect your child to be logging on at least three times a week at home, if this is the case. If your child is secure in this recall, they now need to begin to apply their knowledge in different contexts. Top marks is a great website with lots of games to support lots of concepts. If you have any further questions about this, please contact the Year 6 team.

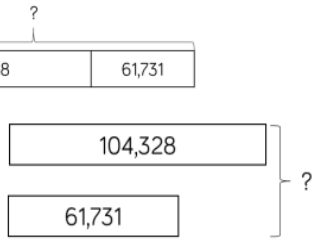
SATs Preparation

SATs take place in May each year and as part of these assessments, children sit three maths papers: arithmetic and two reasoning papers. In year 6, there is very little new learning which takes place and the majority of the content we teach is revision based. The arithmetic paper is worth 40 marks which, if achieved, is almost two-thirds of the way towards reaching age related expectations. As well as in our weekly maths lessons, arithmetic is practised every morning as children arrive in class ,so it is important that children arrive on time each day to complete this. There may also be interventions that children are invited to throughout the year to ensure that they are not only prepared for the SATs, but also secondary school ready. If you have any further questions about this, please contact the Year 6 team.

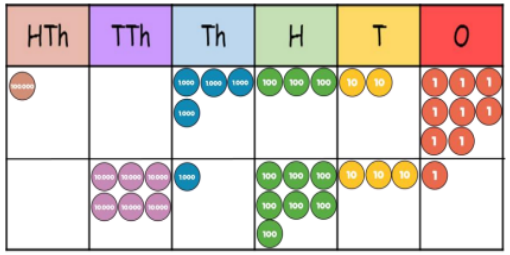
Skill: Add numbers with more than 4 digits

Year: 5/6





104,328 + 61,731 = 166,059



1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
			1		

Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

Example 1:
Adding Decimals

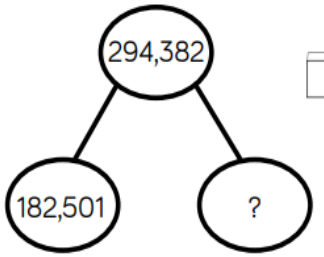
9.8 + 9.7 + 9.425 + 9.85

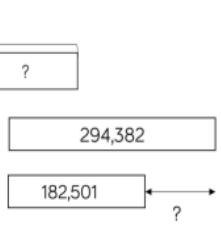
9.800	* line up decimals
9.700	
9.425	* use zeros as placeholders
+ 9.850	
38.775	ADD, remembering the decimal

By the time children get to year 6, they are expected to be working in the abstract when calculating. When dealing with larger or more complex decimal numbers, this would mean using the formal written method of column addition, but with smaller numbers they would be encouraged to use mental methods or jottings as they would have done in previous years. If children are still not confident when working I the abstract, concrete and pictorial resources and strategies can still be used, but are encouraged to be done so independently. It is important that children are able to identify the most efficient methods in each context they are presented with.

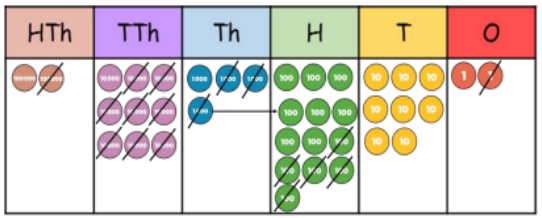
Skill: Subtract numbers with more than 4 digits

Year: 5/6





294,382 − 182,501 = 111,881



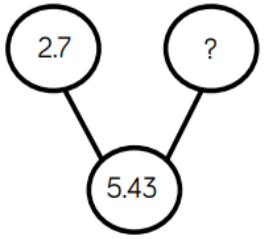
	2	9	3	1 3	8	2
−	1	8	2	5	0	1
	1	1	1	8	8	1

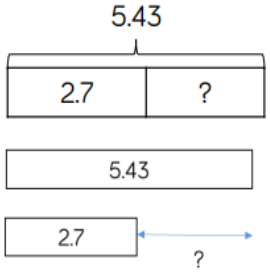
Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Skill: Subtract with up to 3 decimal places

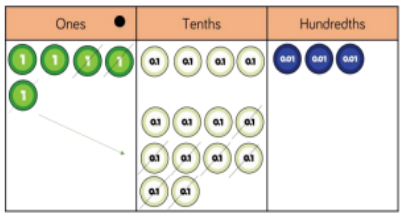
Year: 5/6

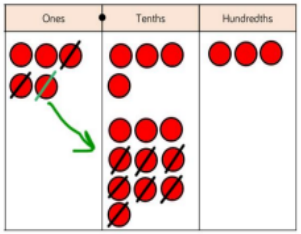




$$\begin{array}{r} {}^{4}\cancel{5}.{}^{1}43 \\ -\ 2.7 \\ \hline 2.73 \end{array}$$

5.43 − 2.7 = 2.73





Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

Skill: Multiply 4-digit numbers by 2-digit numbers	Year: 5/6

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 (2)	1 (5)	9 (3)	1 (7)	2
5 (1)	4	7 (1)	8	0
7	6	6	9	2
		1		

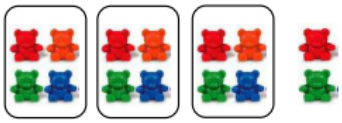
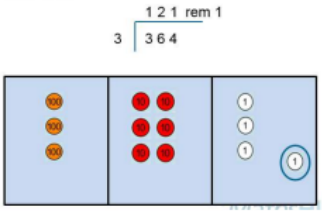
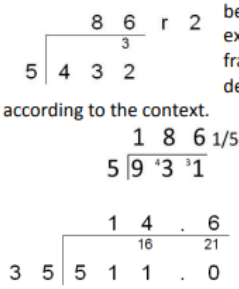
$2{,}739 \times 28 = 76{,}692$

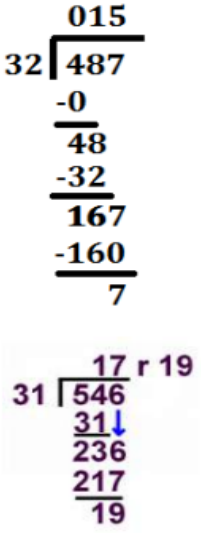
When multiplying 4-digits by 2-digits, children should be confident in using the formal written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.

As with addition and subtraction, children in year 6 are expected to be working in the abstract, using formal written methods when calculating with larger numbers. There work in previous years using concrete and pictorial methods and resources should mean that they are able to understand the concepts and mathematics behind the written methods, understanding how and why they work.

	Objective	Concrete	Pictorial	Abstract
Year 5/6	Division with remainders	14 ÷ 3 = Divide objects between groups and see how much is left over 	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder.  	Complete written divisions and show the remainder using r. 
	Short division with remainders	364 ÷ 3 =  		Move onto divisions with a remainder. Once children understand remainders, begin to express as a fraction or decimal according to the context. 

	Objective	Abstract
Year 6	Long division	Children will use long division to divide numbers with up to 4 digits by 2 digit numbers. 

In the SATs arithmetic paper, questions where long multiplication, or long division are required are worth two marks. If the pupil is able to calculate the correct answer, they are awarded both marks. However, if they make an error in their calculation, they may be awarded one mark if they have demonstrated that they understand the formal written method in their working out. As a result, children are taught and encouraged to use the methods from the National Curriculum, which are demonstrated here.

Fluency and Rapid Recall of Number Facts

In order for children to become confident mathematicians and to be able to solve problems confidently, it is essential that they can re-call all addition and subtraction facts within 20 and that they are able to rapidly recall their multiplication and related division facts. Below is the progression of these facts within the curriculum. As you can see, children should be able to recall all the addition and related subtraction facts by the time they reach the end of year 1. However, not all children learn at the same pace and it is therefore important that we continue to revise and then apply these facts in different contexts on a daily basis. If your child is able to confidently recall all of these facts, practise using them to find other related facts. For example, if I know that 2 + 3 = 5, I also know that 2 tens (20) + 3 tens (30) = 5 tens (50) and 2 hundreds (200) + 3 hundreds (300) = 5 hundreds (500) and so on.

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Mathematics Progression Map: Key Number Facts

	Autumn Term	Spring Term	Summer Term
Reception	• Manipulating Numbers in preparation for Spring onwards • 1+1 • 2+1 • 2+2 • 3+1	• Number bonds to 5 • 2+2 • 3+1 • 2+3 • 4+1 • 3+3 • 4+2 • 5+1 • 5+2 • 4+3 • 6+1 • 4+4 • 5+5	• Number bonds to 5 • Number bonds to 10 • 4+2 • 5 + 2 • 6 + 2 • 7 + 2 • 4 + 3 • 5 + 3 • 6 + 3
Year 1	• 3+8 • 3+9 • 4+7 • 4+8 • 4+9 • 6 + 6 • 7 + 7 • 8 + 8 • 9 + 9 • 8 + 7 • 8 + 9	• 5 + 9 • 6 + 9 • 7 + 9 • 5 + 7 • 5 + 8 • 6 + 8 • 5 + 4 • 5 + 6 • 6 + 7 • 8 + 7 • 8 + 9 • 4 + 9	• X10 tables Consolidation of all previously taught facts
Year 2	• x5 tables • x2 tables	• Revise x2, x5 and x10 tables	• x3 tables **Consolidation of all previously taught facts making connections to facts within 100. For example: If I know that 6+4=10, I know that 60+40=100**
Year 3	• x4 tables • x8 tables	• Revise x8 tables • x11 tables	• x6 tables • Revise 3x, 4x, 8x, 11x and 6x
Year 4	• x9 tables • x12 tables	• x7 tables • Revise x9, x12 and x7 tables	• All tables
Year 5 **Year 6**	• **Throughout Year 5 and 6 children revise all multiplication tables up to 12x12 and the corresponding division facts. For example: 5x8 = 40, 40/8 = 5, 40/5 = 8** • **Children will also use all previously taught addition and subtraction facts to make connections within 10,000,000 and using decimal numbers. For example: If I know that 3+8 = 11, I know that 30,000+80,000=110,000 and I know that 0.3+0.8=1.1**		

Practical Ways of Supporting Mathematics

One of the best ways in which to support your child's learning is to make it as practical as possible and to incorporate it into your every day routines. Here are some ways in which you could support your child's understanding of some of the mathematical concepts taught:

- **Fractions, decimals and percentages**—discuss offers in retail stores such as, 'Half price,' 'Up to 50% off,' '20% off' etc. Measurements very often make use of decimals along with money. Cooking and adapting recipes also often makes reference to fractions and decimals.
- **Time**—make use of timetables for trains and buses when out and about. Ask questions such as, what is the latest time we would need to catch the bus if we wanted to arrive at…? How long does it take to get from...to…?
- **Statistics**—explore tables and graphs in newspapers and magazines linked to a variety of topics.

Maths – End of Year 6 Expectations	
New National Curriculum Objectives	
Number and Place Value	use negative numbers in context, and calculate intervals across zero
	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1 000 where the answers are up to three decimal places
	round any whole number to a required degree of accuracy
	solve problems which require answers to be rounded to specified degrees of accuracy
	solve number and practical problems that involve all of the above
	Use decimal notation for tenths, hundredths and thousandths, partition and order numbers with up to three decimal places, and position them on the number line
Addition and Subtraction	perform mental calculations, including with mixed operations and large numbers
	use their knowledge of the order of operations to carry out calculations involving the four operations
	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	solve problems involving addition, subtraction, multiplication and division
Multiplication and Division	perform mental calculations, including with mixed operations and large numbers
	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
	use written division methods in cases where the answer has up to two decimal places
	identify common factors, common multiples and prime numbers
	use their knowledge of the order of operations to carry out calculations involving the four operations
	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
	recognise that prime numbers have only two factors and identify prime numbers less than 100; find the prime factors of two-digit whole numbers
	Check calculations for accuracy using the rules of divisibility
	solve problems involving addition, subtraction, multiplication and division
Fractions, decimals and Percentages	compare and order fractions including fractions >1
	identify the value of each digit in numbers given to three decimal places
	solve problems which require answers to be rounded to specified degrees of accuracy
	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)
	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
	multiply simple pairs of proper fractions, writing the answer in its simplest form
	find fractions and percentages of whole-number quantities, e.g. 5/8 of 96, 65% of £260
Decimals and Percentages	multiply one-digit numbers with up to two decimal places by whole numbers
	Divide proper fractions by whole numbers
	multiply one-digit numbers with up to two decimal places by whole numbers
	multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places

Maths – End of Year 6 Expectations

New National Curriculum Objectives

	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
	use written division methods in cases where the answer has up to two decimal places
Ratio and Proportion	solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
	solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
	solve problems involving similar shapes where the scale factor is known or can be found
	solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
Algebra	express missing number problems algebraically
	find pairs of numbers that satisfy number sentences involving two unknowns
	use simple formulae
	generate and describe linear number sequences
Measurement and Time	calculate, estimate and compare volume of cubes and cuboids using standard units. Extend to mm and km
	recognise when it is possible to use formulae for area and volume of shapes
	solve problems involving the calculation and conversion of **units of measure**, using decimal notation up to three decimal places where appropriate
	recognise that shapes with the same areas can have different **perimeters** and vice versa
	calculate the area of parallelograms and triangles
	calculate, estimate and compare volume of cubes and cuboids using standard units
	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
	convert between miles and kilometres
Geometry Shape and Position	recognise, describe and build simple 3-D shapes, including making nets
	illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
	draw 2-D shapes using given dimensions and angles
	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
	describe positions on the full coordinate grid (all four quadrants)
	draw and translate / rotate simple shapes on the coordinate plane, and reflect them in the axes.
Statistics	interpret and construct pie charts and line graphs and use these to solve problems; Solve problems involving selecting, processing, presenting and interpreting data, using ICT where appropriate; construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts; draw conclusions
	calculate and interpret the mean, median and mode as an average
	discuss the likelihood (probability) of an event.

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