



Mayville Primary School

A Parent Guide to Mathematics (Year 5)



Working together in the pursuit of excellence for all

Mathematics teaches children how to make sense of the world around them through developing their ability to use numbers, calculate, reason and solve problems. It helps children understand relationships and patterns, in both numbers and space in their everyday lives.

Intent

The 2014 National Curriculum for mathematics aims to ensure that all children:

- become fluent in the fundamentals of mathematics;
- are able to reason mathematically;
- can solve problems by applying their mathematical knowledge.

At Mayville Primary School, these aims are embedded within maths lessons and the corresponding skills are developed over time. We want all children to enjoy mathematics and to experience success in the subject. We are committed to developing children's curiosity about the subject as well as an appreciation of the beauty and power of mathematics.

Implementation

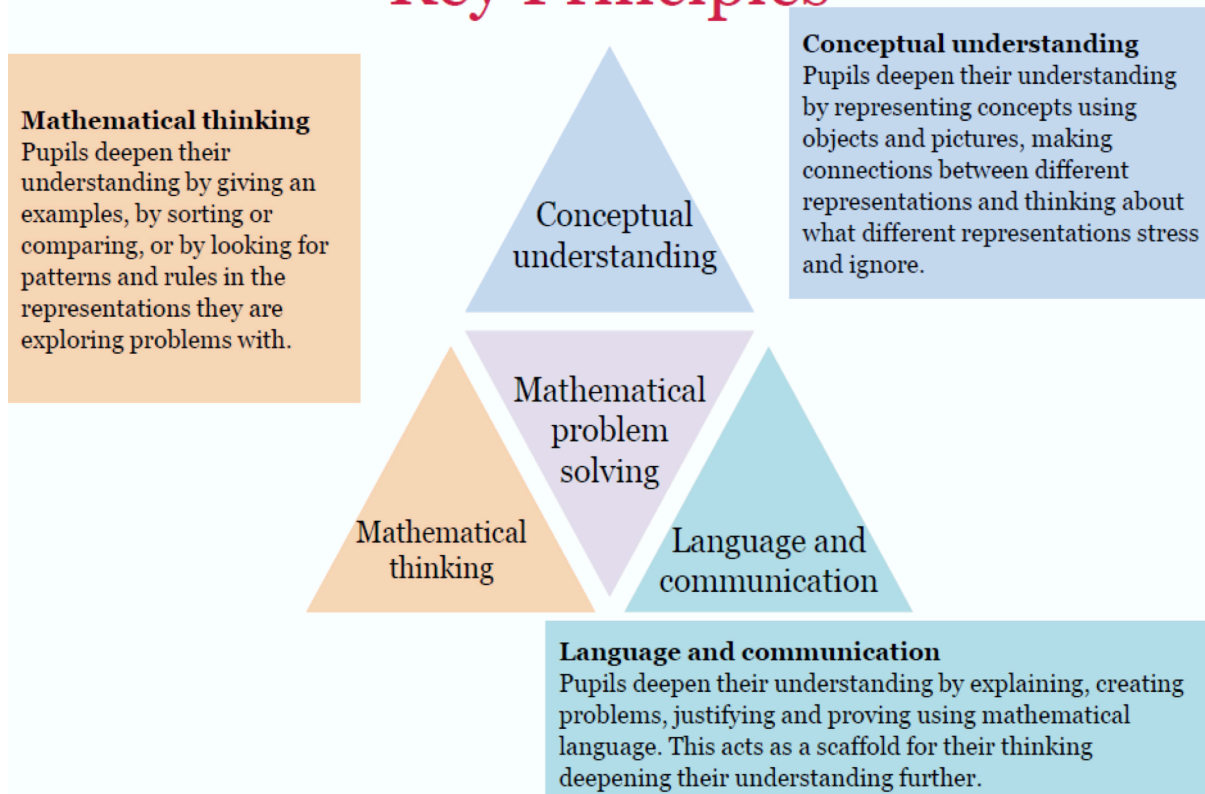
The content and principles underpinning the 2014 National Curriculum and the maths curriculum at Mayville reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Shanghai and South Korea.

- Teachers reinforce an expectation that all children are capable of achieving high standards in mathematics.
- All lessons contain: fluency, reasoning and problem-solving activities.
- All activities, within a lesson, are differentiated at 3 levels: 'developing', 'expected' and 'greater depth'.
- Differentiation is also achieved by emphasising deep knowledge and through individual support and intervention.
- When suitable, teachers will use the CPA sequence of modelling (concrete > pictorial > abstract) to nurture a conceptual understanding of mathematics.
- When suitable, teachers will encourage pupils to use the Singapore bar-method to tackle problem-solving questions.
- To ensure whole-school consistency and progression, the school uses the White Rose Maths schemes of learning. These schemes of work are fully aligned with the National Curriculum and have an emphasis on fluency, problem-solving and reasoning. Mathematical topics are taught in blocks to enable the achievement of 'mastery' through depth.
- The White Rose Maths schemes of learning are complemented with fully aligned resources from classroomsecrets.co.uk; CGP and Twinkl.
- Teaching is underpinned by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Teachers will use precise questioning in class to test conceptual and procedural knowledge and will assess pupils regularly to identify those requiring intervention, so that all children keep up.
- Pupils will receive high quality feedback that will extend/consolidate their knowledge or clarify misconceptions. When giving feedback, teachers will draw a distinction between a 'response question' and a 'next-step question' (please refer to the section of marking and feedback).

- Pupils in Yr 6 will be taught the laws of mathematics so that they have a clear understanding of why and how operations are carried out. These laws include: the commutative law, associative law, distributive law and the laws of identity. Learning these laws and their applications will empower pupils to achieve higher in mathematics.

Maths Mastery

Key Principles



In what sequence will my child learn mathematics?

Our school follows the White Rose Maths scheme of learning which can be found here: <https://whiterosemaths.com/resources/primary-resources/primary-sols/>

Mathematics in Year 5

During the years of upperscase Key Stage 2 (Year 5 and Year 6), children use their knowledge of number bonds and multiplication tables to tackle more complex problems, including larger multiplication and division, and meeting new material. In Year 5, this includes more work on calculations with fractions and decimals, and using considerably larger numbers than previously.

Number and Place Value

- Recognise and use the place value of digits in numbers up to 1 million (1,000,000)
- Use negative numbers, including in contexts such as temperature
- Round any number to the nearest 10, 100, 1,000, 10,000 or 100,000
- Read Roman numerals, including years

Calculations

- Carry out addition and subtraction with numbers larger than four digits
- Use rounding to estimate calculations and check answers are of a reasonable size
- Find factors of multiples of numbers, including finding common factors of two numbers
- Know the prime numbers up to 19 by heart, and find primes up to 100
- Use the standard methods of long multiplication and short division
- Multiply and divide numbers mentally by 10, 100 or 1,000
- Recognise and use square numbers and cube numbers

Factors are numbers which multiply to make a product, for example 2 and 9 are factors of 18.

Common factors are numbers which are factors of two other numbers, for example 3 is a factor of both 6 and 18.

Fractions and Decimals

- Put fractions with the same denominator into size order, for example recognising that $\frac{3}{5}$ is larger than $\frac{2}{5}$
- Find equivalents of common fractions
- Convert between improper fractions and mixed numbers, for example recognising that $\frac{5}{4}$ is equal to $1\frac{1}{4}$
- Convert decimals to fractions, for example converting 0.71 to $\frac{71}{100}$
- Round decimals to the nearest tenth
- Put decimals with up to three decimal places into size order
- Begin to use the % symbol to relate to the 'number of parts per hundred'

In a fraction, the numerator is the number on top; the denominator is the number on the bottom.

Measurements

- Convert between metric units, such as centimetres to metres or grams to kilograms
- Use common approximate equivalences for imperial measures, such as $2.5\text{cm} \approx 1$ inch
- Calculate the area of rectangles using square centimetres or square metres
- Calculate the area of shapes made up of rectangles
- Estimate volume (in cm^3) and capacity (in ml)

Shape and Position

- Estimate and compare angles, and measure them to the nearest degree
- Know that angles on a straight line add up to 180° , and angles around a point add up to 360°
- Use reflection and translation to change the position of a shape

Graphs and Data

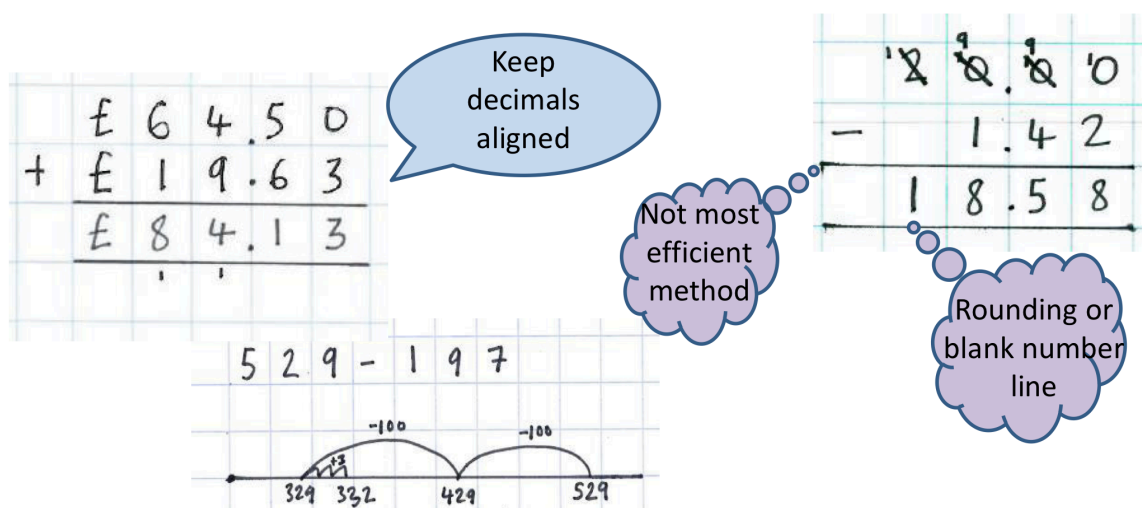
- Read and understand information presented in tables, including timetables
- Solve problems by finding information from a line graph

Parent Tip

Much of the knowledge in Year 5 relies on number facts being easily recalled. For example, to find common factors or to make simple conversions, knowledge of multiplication tables is essential. Any practice at home to keep these skills sharp will certainly be appreciated by your child's class teacher!

Addition & subtraction in Year 5

Column method with up to four digits



Year 5 and 6: Add whole numbers with more than 4 digits, including using formal written methods (columnar addition).

Consolidate previous learning and apply it in multi-step problems.

Mentally add numbers using known facts.

Multiplication in Year 4, 5 & 6

Short multiplication

(Any number multiplied by a one digit number)

Year 5: Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

Year 6: Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

The figure shows a handwritten short multiplication problem on grid paper:

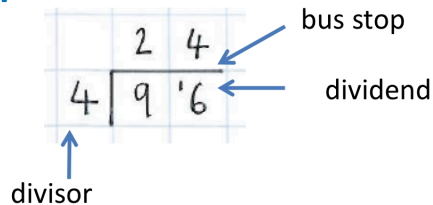
$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \end{array}$$

1. Multiply the ones
2. Regroup the tens (if needed)
3. Multiply the tens
4. Add the re-grouped tens

Multiplication in Year 4, 5 & 6

Short division (With a one digit divisor)

$$96 \div 4 = 24$$

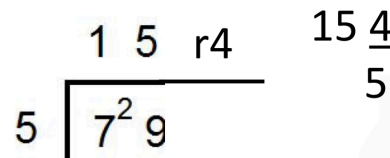
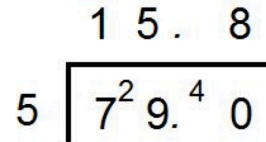


As above, when there is a remainder once the ones within the dividend has been divided by the divisor:
 4. Insert a decimal point after the ones with the bus stop and above the bus stop (within the answer)
 5. Write the remainder, small, after the decimal point and insert a zero as a place holder i.e. 40
 6. Divide the tenths by the divisor and record the answer after the decimal above the bus stop.

If there is a remainder write in small with the bus stop and write a zero as a place holder.

1. Divide the first number inside the bus stop by the divisor.
2. Write the answer on top and write the remainder, small, before the ones within the dividend.
3. Divide the second number (two digit number i.e. 16) by the divisor and record the answer at the top of the bus stop.

$$79 \div 5 = 15.8$$



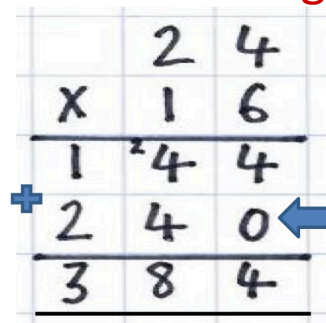
Multiplication in Year 5 & 6

Formal written method (Any number multiplied by two or more digits)

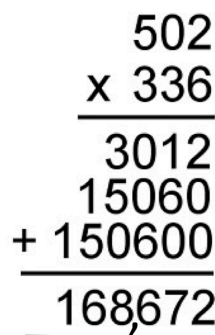
$$24 \times 16 =$$

Same as short multiplication, and then:

5. Place a zero in the ones column
6. Multiply the tens by the ones
7. Regroup the tens (if needed)
8. Multiply the tens by the tens
9. Add the re-grouped tens
10. Draw an equals
11. Add each column, starting with the ones to the tens to the hundreds



Zero as the place holder for the ones column



Zero as the place holder for the ones column

Two zeroes as the place holder for the ones and ten column

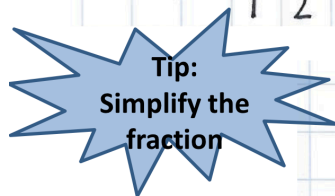
Division in Year 5 & 6

Formal written method (With a two digit divisor)

Chunking by repeated subtraction

$$432 \div 15$$

		28	$\frac{4}{5}$	or	28.8
15	432				
	300	(20 x 15)			
-	132				
	75	(5 x 15)			
-	57				
	45	(3 x 15)			
	12				



$$\frac{12}{15} = \frac{4}{5} = 0.8$$

1. Use known multiplication facts to chunk i.e. $15 \times 2 = 30$ so $15 \times 20 = 300$.
2. Record the answer below the number inside the bus stop and write the multiplication in brackets on the right hand side)
3. Subtract the two numbers and write the answer below.
4. Repeat the above steps until you can no longer divide the dividend by the divisor.
5. Total the numbers in the brackets which were multiplied by the divisor and write the answer above the bus stop.

Division in Year 5 & 6

Formal written method (With a two digit divisor)

$$432 \div 15$$

	28	r 12
15	432	
	30	↓
	132	
	120	
	12	

$$\frac{12}{15} = \frac{4}{5} = 0.8$$



How to Divide!



Does ÷ (divide)
 McDonald's X (multiply)
 Serve - (subtract)
 Burgers? ↓ (bring down)
 Repeat

1. Divide the divisor into the first digit of the dividend. If it can't divide then look at the next digit as a two digit number and divide.
2. Record the answer at the top of the bus stop i.e. 15 goes into 43 two times, $15 \times 2 = 30$
3. Take the answer away from the two digit number at the start of the bus stop i.e. $43 - 30 = 13$
4. Carry down the ones from under the bus stop i.e. 132
5. Repeat the above steps until the divisor can no longer go into the dividend

Challenge

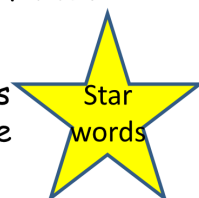
- Fractions, decimals, percentages

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
$\frac{1}{2}$ and $\frac{1}{4}$	$\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{1}{3}$	Add and subtract fractions with the same denominator up to one whole $\frac{1}{4} + \frac{1}{4} = \frac{1+1}{4} = \frac{2}{4}$	Add and subtract fractions with the same denominator where the answer may be an improper fraction $\frac{4}{8} + \frac{5}{8} = \frac{9}{8}$	Add and subtract fractions where one denominator is a multiple of another $\frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{2+1}{6} = \frac{3}{6}$ $\frac{1}{3} = \frac{2}{6}$	Add and subtract fractions with different denominators Multiply simple pairs of proper fractions Divide proper fractions by whole numbers $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{4+3}{12} = \frac{7}{12}$
				Find 10% of a number Find a multiple of 10% of a number Find 5% of a number Find 10% of £90 $90 = 100\%$ $9 = 10\%$ $18 = 20\%$	Find a multiple of 5% of a number Find 1% of a number Find 5% of £90 $90 = 100\%$ $9 = 10\%$ $4.5 = 5\%$

Language & Reasoning

The 2014 National Curriculum is explicit in articulating the importance of children using the correct mathematical language as a central part of their learning.

The Talk Task is a crucial opportunity for children to perform tasks where recording is at a minimum with the focus instead being on the correct use of mathematical language.



Megan has made a 3-digit number with these cards.



What is the largest number you can make with these cards?
Explain your answer.

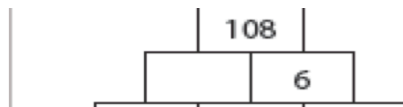




Props around the house

Ideas taken from **Maths for Mums and Dads** Eastaway, R. and Askew, M. (2010)

- **A prominent clock**- digital and analogue is even better. Place it somewhere where you can talk about the time each day.
- **A traditional wall calendar**-Calendars help with counting days, spotting number patterns and
- **Board games that involve dice or spinners**-helps with counting and the idea of chance
- **A pack of playing cards**- Card games can be adapted in many ways to learn about number bonds, chance, adding and subtracting
- **A calculator**- A basic calculator will help with maths homework when required, there are also many calculator games you can play, too.
- **Measuring Jug**-Your child will use them in school, but seeing them used in real life is invaluable. Also useful for discussing converting from metric to imperial
- **Dried beans, Macaroni or Smarties**- for counting and estimating
- **A tape measure and a ruler**- Let your child help when measuring up for furniture, curtains etc
- **A large bar of chocolate** (one divided into chunks)- a great motivator for fractions work
- **Fridge magnets with numbers on**- can be used for a little practice of written methods
- **Indoor/outdoor Thermometer**- especially useful in winter for teaching negative numbers when the temperature drops below freezing
- **Unusual dice**- not all dice have faces 1-6, hexagonal dice, coloured dice, dice from board games all make talking about chance a little more interesting
- **A dartboard with velcro darts**- Helps with doubling, trebling, adding and subtracting.



Glossary

Abacus – A tool used to assist the teaching and learning in Year 5 and 6

Abstract – Written down calculation

Bridging – Moving through the 10, 100, 1000 boundary

Bus stop – Visual representation used for to lay out short division

Concrete – Hands on, practical resources

Denominator – The bottom number in a fraction

Digit – A symbol used to make numerals 0-9

Dividend – The amount you want to divide up

Divisor – The number you divide by

Improper fraction – Where a fraction is top heavy; the numerator is larger than the denominator

Mathematics Mastery - A tool to used to assist the teaching and learning from Reception to Year 4, on a rolling programme

Mixed number fraction - A whole number and a fraction combined

Numerator – The bottom number in a fraction



How you can do Maths at Home



- money to go shopping with.
- Change can be the trickiest concept and needs to be taught in 'real' shopping activities which can be done really well at home.

Number games

- Board games
- Snakes and ladders
- Dominoes
- Playing card games eg snap, doubles
- Dice games eg exchange game
- Have fun playing with a calculator and try out those signs!



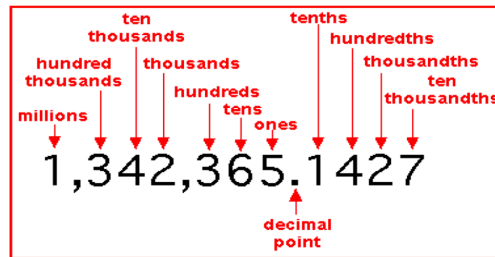
Shapes everywhere

- **Shopping Shape Sort**; let your child loose on the packages and sort them into cuboids, cylinders, cubes
- **2-D shape pictures and patterns**
- Which shapes can you draw? you will need a ruler for some of them!

Partitioning – Splitting a number into parts

Place holder - A significant zero in the decimal representation of a number

Place value - The value of where the digit is in the number (see diagram)



Proper fraction - A fraction where the numerator is less than the denominator

Re-grouping - Making groups of tens when adding or subtracting two digit numbers (or more) and is another name for 'carrying' and 'borrowing'.

Remainder - The amount left over after division

Rounding - Making a number simpler but keeping its value close to what it was.

Simplify - Divide the top and bottom by the highest number that can divide into both numbers in the fraction exactly

Skip counting - Counting forwards or backwards by a number other than 1

Vinculum - The horizontal line used to separate the numerator and denominator in a fraction

Visual – Mathematical concepts represented by pictures

