



Mayville Primary School

A Parent Guide to Mathematics (Year 4)



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

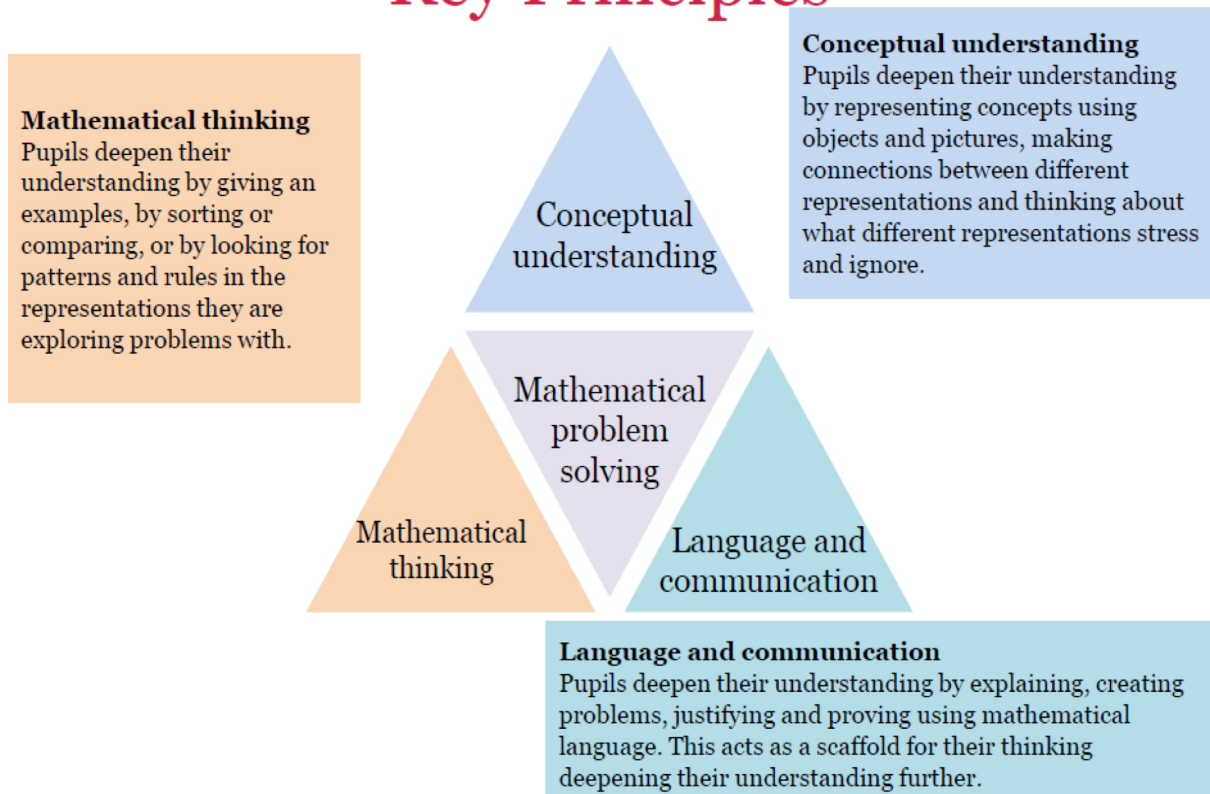
The content and principles underpinning the 2014 National Curriculum and the maths curriculum at Mayville reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Shanghai and South Korea.

- 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



Mathematics in Year 4

By the end of Year 4, children will be expected to know all of the times tables up to 12×12 by heart. This means not only recalling them in order, but also being able to answer any times table question at random, and also knowing the related division facts. For example, in knowing that $6 \times 8 = 48$, children can also know the related facts that $8 \times 6 = 48$ and that $48/6 = 8$ and $48/8 = 6$. This expertise will be particularly useful when solving larger problems and working with fractions.

Number and Place Value

- Count in multiples of 6, 7, 9, 25 and 1,000
- Count backwards, including using negative numbers
- Recognise the place value in numbers of four digits (1000s, 100s, 10s and 1s)
- Put larger numbers in order, including those greater than 1,000
- Round any number to the nearest 10, 100 or 1,000
- Read Roman numbers up to 100

Roman Numerals' Basics:

I = 1 ; V = 5 ; X = 10 ; L = 50 ; C = 100

Letters can be combined to make larger numbers. If a smaller value appears in front of a larger one then it is subtracted, e.g. IV (5 - 1) means 4. If the larger value appears first then they are added, e.g. VI (5 + 1) means 6.

Calculations

- Use the standard method of column addition and subtraction for values up to four digits
- Solve two-step problems involving addition and subtraction
- Know the multiplication and division facts up to $12 \times 12 = 144$
- Use knowledge of place value, and multiplication and division facts to solve larger calculations
- Use factor pairs to solve mental calculations, e.g. knowing that 9×7 is the same as $3 \times 3 \times 7$
- Use the standard short multiplication method to multiply three-digit numbers by two-digit numbers

Parent Tip

Playing traditional games, such as battleships or even draughts and chess, is great for exploring coordinates and movements across the coordinate grid.

Fractions

- Use hundredths, including counting in hundredths
- Add and subtract fractions with the same denominator, e.g. $\frac{4}{7} + \frac{5}{7}$
- Find the decimal value of any number of tenths or hundredths, for example $\frac{7}{100}$ is 0.07
- Recognise the decimal equivalents of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$
- Divide one- or two-digit numbers by 10 or 100 to give decimal answers
- Round decimals to the nearest whole number
- Compare the size of numbers with up to two decimal places

Measurements

- Convert between different measures, such as kilometres to metres or hours to minutes
- Calculate the perimeter of shapes made of squares and rectangles
- Find the area of rectangular shapes by counting squares
- Read, write and convert times between analogue and digital clocks, including 24-hour clocks
- Solve problems that involve converting amounts of time, including minutes, hours, days, weeks and months

Shape and Position

- Classify groups of shapes according to the properties, such as sides and angles
- Identify acute and obtuse angles
- Complete a simple symmetrical figure by drawing the reflected shape
- Use coordinates to describe the position of something on a standard grid
- Begin to describe movements on a grid by using left/right and up/down measures

Graphs and Data

- Construct and understand simple graphs using discrete and continuous data

Discrete data is data which is made up of separate values, such as eye colour or shoe size. Continuous data is that which appears on a range, such as height or temperature.

Multiplication tables check

At the end of Year 4, children will be expected to sit a statutory online multiplication table check (MTC). The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics.

Children are expected to know all of their times tables up to 12 x 12.

A video explanation from the DfE can be found here:

<https://youtu.be/GhAJMJUsAac>

Children will be tested using an on-screen check (on a computer or a tablet), where they will have to answer multiplication questions against the clock.

The test will last no longer than 5 minutes and is similar to other tests already used by primary schools. Their answers will be marked instantly.

Children will have 6 seconds to answer each question in a series of 25. Each question will be worth one mark.

Questions will be selected from the 121 number facts that make up the multiplication tables from 2 to 12, with a particular focus on the 6, 7, 8, 9 and 12 times tables as they are considered to be the most challenging. Each question will only appear once in any 25-question series, and children won't be asked to answer reversals of a question as part of the check (so if they've already answered 3 x 4 they won't be asked about 4 x 3).

Once the child has inputted their answer on the computer / device they are using, there will be a three-second pause before the next question appears. Children will be given the opportunity to practise answering questions in this format before the official check begins.

The six-second time limit per question has been decided on by the DfE because it should allow children enough time to demonstrate their recall of times tables without giving them the time to work out the answers to each question.

How can you help your child practise their times tables?

Because the National Curriculum for maths is so extensive, there is an expectation that parents will help their children learn their times tables at home and not rely on schools to bring them up to speed.

Some of the techniques you can use include:

- Practising times tables by rote.
- Asking your child multiplication questions out of order – such as 'What's 11x12? What's 5x6?'

- Asking your child the related **division** facts: 'What's 8/4? What's 9/3?'
- Using **arrays** to help your child memorise times tables – you can use fun objects like Smarties or Lego bricks to make it more entertaining.
- Giving your child **word problems** to test their skills, like 'If Peter has 800ml of orange juice and needs to share it between four friends, how much can they each have?'
- Using **times tables apps** and games like TheSchoolRun's **multiplication games** to build speed.

[Free times tables resources and advice for primary-school parents](#)

For information, worksheets, games, eBooks and learning packs to help you support your child in learning their times tables go to our **Times Tables learning hub**.

Specific tips for each multiplication table:

- Learning the **2 times table**
- Learning the **3 times table**
- Learning the **4 times table**
- Learning the **5, 10, 11 and 12 times tables**
- Learning the **6, 8 and 9 times tables**
- Learning the **7 times table**

Add and subtract numbers mentally, including:

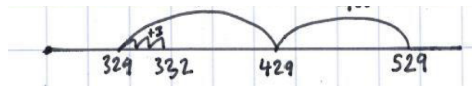
- a three-digit number and ones; $321 + 8$ $321 - 9$
- a three-digit number and tens; $321 + 20$ $321 - 20$
- a three-digit number and hundreds $321 + 200$ $321 - 200$

Column method with three and four digit numbers; bridging 1,000

1. Add/subtract the ones
2. Regroup (above the tens)
3. Add/subtract the tens

$$\begin{array}{r} 734 \\ + 286 \\ \hline \end{array}$$

$$\begin{array}{r} 8912812 \\ - 457 \\ \hline 475 \end{array}$$



Multiplication & division in Year 4

Recall all times tables up to 12×12

Using known facts and place value for mental multiplication involving multiples of 10 and 100

Mental multiplication of any 2-digit number by a 1-digit number, by partitioning

Mental multiplication of 3 1-digit numbers

$$2 \times 3 \times 4 = 24$$

$$3 \times 4 \times 2 = 24$$

$$13 \times 3$$

$$10 \times 3 = 30$$

$$3 \times 3 = 9$$

$$30 + 9 = 39$$

$$7 \times 3 = 21$$

$$7 \times 30 = 210$$

$$70 \times 3 = 210$$

$$70 \times 30 = 2100$$

$$700 \times 3 = 2100$$

$$7 \times 300 = 2100$$

Division of a one- or two-digit number by 10 and 100

$$27 \div 10 = 2.7$$



$$27.0 \div 10 = 2.7$$

Divide by 10 = 10 times smaller – move decimal one place to the left

Divide by 100 = 100 times smaller - move decimal two places to the left

Short multiplication of 3-digit number by 1-digit number

Short division of 4-digit numbers by 1-digit numbers

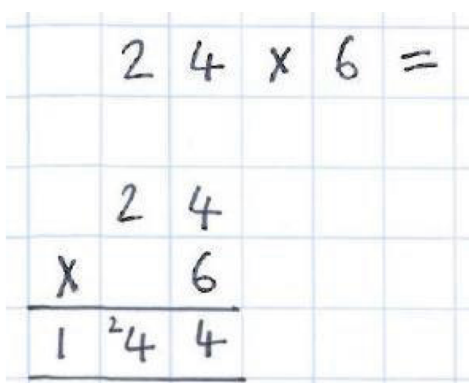
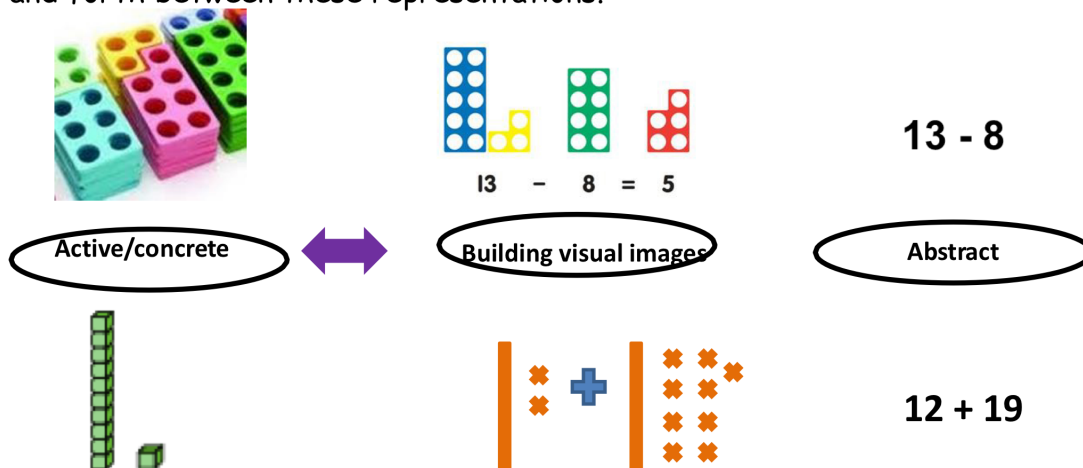
Arithmetic

Mental arithmetic is an important life skill and regular practice is critical. Without fluency in mental maths to underpin their work in number, children will struggle with many other areas of mathematics. Children who are fluent with number will be able to use their mental arithmetic skills to find efficient strategies for completing calculations, recalling and applying number knowledge rapidly and accurately.

Year 1	Year 2	Year 3	Year 4
Number bonds within 10 and 20. Roll 2, 10 and 5 times tables	Recall the 2, 5 and 10 times tables	Recall the 2, 3, 4, 5, 8 and 10 times tables	Recall all times tables up to 12 x 12

Concrete, Visual, Abstract

The principle of the CVA approach is that for children to have a true understanding of a mathematical concept there are three phases they need to master: concrete, pictorial and abstract. Reinforcement is achieved by going back and forth between these representations.



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)

1. Divide the first number inside the bus

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.



Write as many words meaning '+' symbol as possible in 15 seconds.

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



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

Why?

Why not?

What if?

Problem solving



Word problems:

There are 10 people on a bus. 4 people get on and 3 people get off. How many people are left on the bus?

Finding patterns:

How many squares would be shaped in the 6th shape in this sequence? How do you know?



How you can support at home

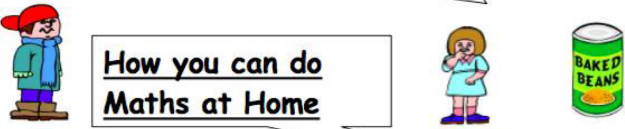


Measuring

- **Cooking**- weighing and following instructions
- **Measure yourself!** - make a height strip. Keep a graph to show your growth! How much have you grown?
- **Measure stuff!** - use a tape measure
- **Telling the time**- how long until...? Analogue /digital time, Days of the week, dates, keep a calendar/

Picnic or Party maths:

- Preparing food for a group of people is a real problem solving opportunity; how many cups can we fill with one jug, how many pieces of pizza can we cut from each one? A great opportunity to use terms like 'half' 'quarter' 'double' and put those tables into practice.



How you can do Maths at Home

Shopping games:

- Set up a mini supermarket in the kitchen and give the children some real 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!



Props around the house

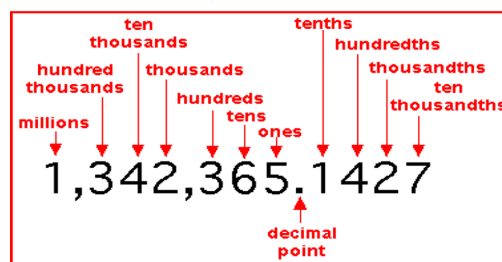
Ideas taken from **Maths for Mums and Dads** Eastaway, R. and Askew, M. (2010)

- **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

Partitioning – Splitting a number into parts

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



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

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

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

Glossary

Abstract – Written down calculation

Array – Objects or numbers arranged in rows and columns

Bar model – Picture representations in the form of bars to represent relationships between facts in a problem

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

Numerator – The bottom number in a fraction

