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# Mayville Primary School

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## A Parent Guide to Mathematics (Year 3)



*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

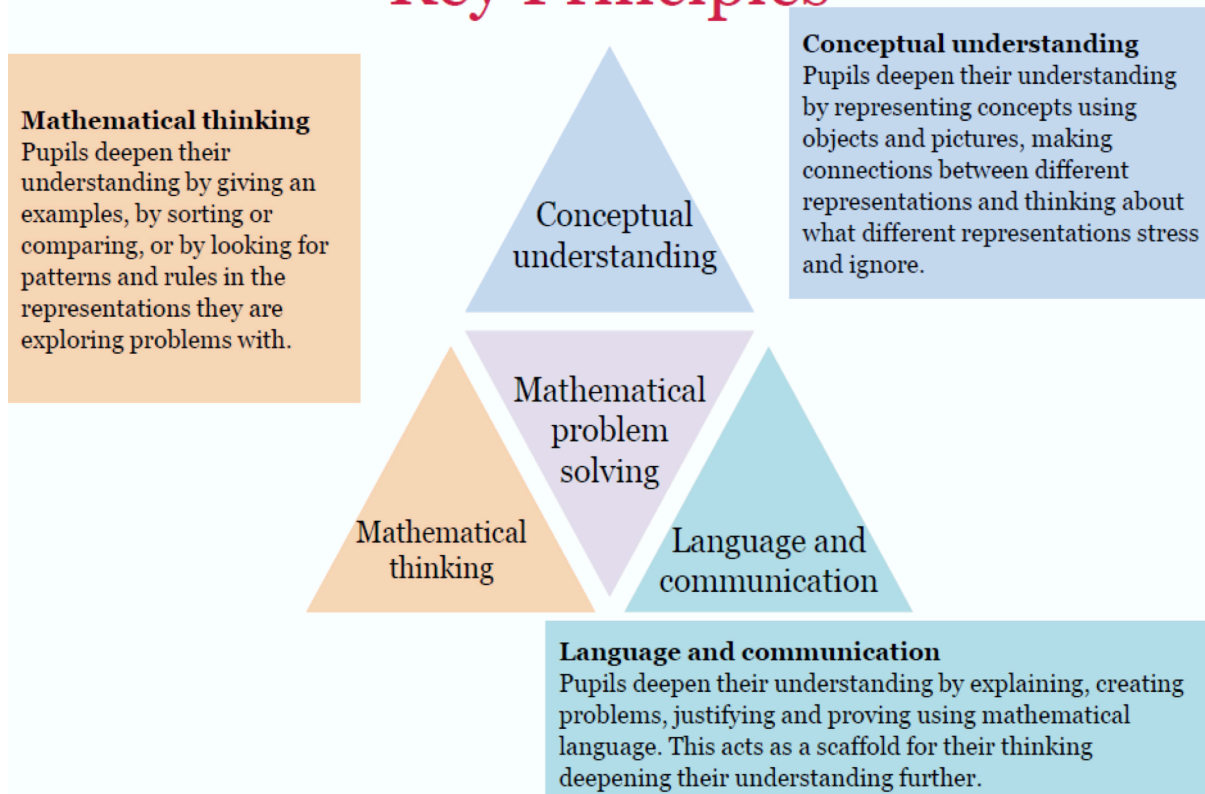
The content and principles underpinning the 2014 National Curriculum and the maths curriculum at Mayville reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Shanghai and South Korea.

- 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](http://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 3

During the years of lower key stage two (Year 3 and Year 4), the focus of mathematics is on the mastery of the four operations (addition, subtraction, multiplication and division) so that children can carry out calculations mentally, and using written methods. In Year 3 your child is going to be introduced to the standard written column method of addition and subtraction.

### Number and Place Value

- Count in multiples of 4, 8, 50 and 100
- Recognise the place value of digits in three-digit numbers (using 100, 10s and 1s)
- Read and write numbers up to 1,000 using digits and words
- Compare and order numbers up to 1,000

### Calculations

- Add and subtract numbers mentally, including adding either 1s, 10s or units to a 3-digit number
- Use the standard column method for addition and subtraction for up to three digits
- Estimate the answers to calculations, and use inverse calculations to check the answers
- Learn the 3x, 4x and 8x tables and the related division facts, for example knowing that  $56 \div 8 = 7$
- Begin to solve multiplication and division problems with two-digit numbers

### Fractions

Equivalent fractions are fractions which have the same value, such as  $\frac{1}{2}$  and  $\frac{3}{6}$  or  $\frac{1}{4}$  and  $\frac{2}{8}$ .

- Understand and use tenths, including counting in tenths
- Recognise and show equivalent fractions with small denominators
- Add and subtract simple fractions worth less than one, for example  $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$
- Put a sequence of simple fractions into size order



## Measurements

- Solve simple problems involving adding and subtracting measurements such as length and weight
- Measure the perimeter of simple shapes
- Add and subtract amounts of money, including giving change
- Tell the time to the nearest minute using an analogue clock
- Use vocabulary about time, including a.m. and p.m., hours, minutes and seconds
- Know the number of seconds in a minute and the number of days in a year or leap year

## Shape and Position

- Draw familiar 2-d shapes and make familiar 3-d shape models
- Recognise right angles, and know that these are a quarter turn, with four making a whole turn
- Identify whether an angle is greater than, less than or equal to a right angle
- Identify horizontal, vertical, perpendicular and parallel lines

Parallel lines are those which run alongside each other and never meet.  
Perpendicular lines cross over each other meeting exactly at right angles.

## Graphs and Data

- Present and understand data in bar charts, tables and pictograms
- Answer questions about bar charts that compare two pieces of information

## Addition & subtraction in Year 3

Same as Year 2

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

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

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

## Addition & subtraction in Year 3

Partitioning one number

$$22 \xrightarrow{+10} 32 \xrightarrow{+7} 39 \quad 22 + 17 = 39$$

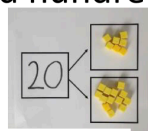
Rounding one number

$$41 \xrightarrow{-2} 39 \xrightarrow{+3} 42 \quad 54 \xrightarrow{-10} 44 \xrightarrow{-2} 42 \quad 54 - 12 = 42$$

Counting on in tens and hundreds

$$22 \xrightarrow{+20} 42 \xrightarrow{+3} 45 \quad 22 + 17 = 39 \quad 53 \xrightarrow{-20} 33 \xrightarrow{+3} 36 \quad 53 - 17 = 36$$

Part – part – whole



$$20 = 7 + 13$$

$$20 - 13 = 7$$

Make 10

$$38 \xrightarrow{+2} 40 \xrightarrow{+10} 50 \xrightarrow{+3} 53$$

$$38 + 15 = 53$$

$$42 - 15 = 27$$

Column method

$$\begin{array}{r} 24 \\ + 17 \\ \hline \end{array}$$

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

$$\begin{array}{r} \text{hundreds} \quad \text{tens} \quad \text{ones} \\ 1 \quad 4 \quad 7 \\ - 1 \quad 8 \\ \hline 1 \quad 2 \quad 9 \end{array}$$

Using known facts

$$3 + 4 = 7$$

$$30 + 40 = 70$$

$$300 + 400 = 700$$

$$8 - 4 = 4$$

$$80 - 40 = 40$$

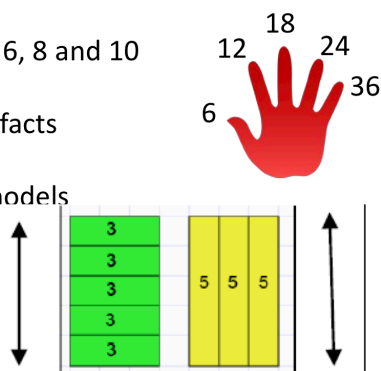
$$800 - 400 = 400$$

# Multiplication & division in Year 3

Skip counting in multiples of 2, 3, 4, 5, 6, 8 and 10

Doubling to derive new multiplication facts

Part- part whole with arrays and bar models



$$3 \times 3 = 9$$

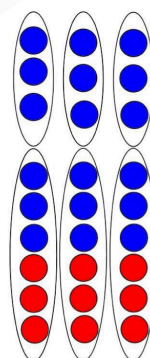
$$3 \times 6 = 18$$

$$5 = 1 \times 5$$

$$50 = 10 \times 5$$

$$500 = 100 \times 5$$

$$5000 = 1000 \times 5$$



$$50 \div 10 = 5$$



$$48 \div 4 = 12$$

Using known facts for multiplying and dividing by multiples of 10, 100 and 1000

Multiplying & dividing of 2-digit numbers with partitioning (no regrouping & regrouping)

×	10	2
3	30	6

$$3 \times 12 = 36$$

×	10	4
3	30	12

$$14 \times 3 = 42$$

thousands	hundreds	tens	ones

## 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

# 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

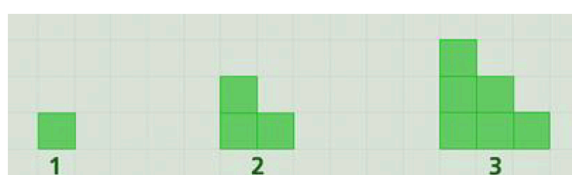


*Word problems:*

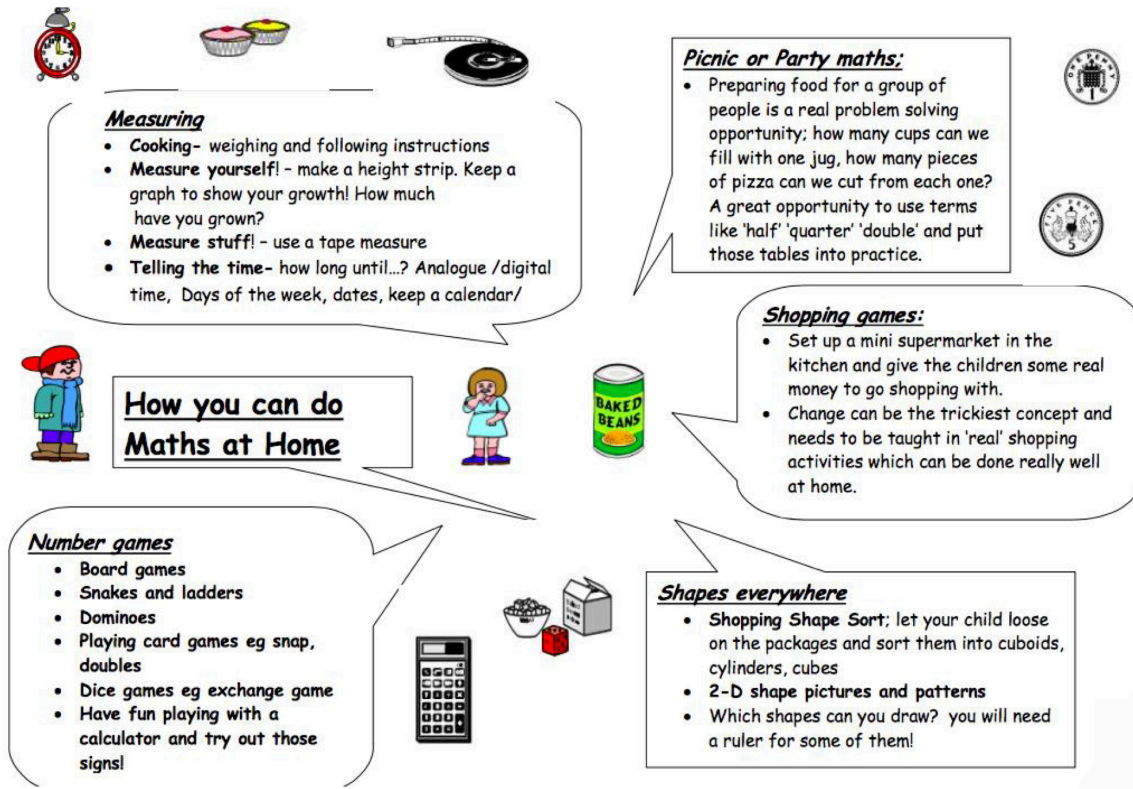
*There are 10 people on a bus. 4 people get on and 3 people get off. How many people are left on the bus?*

*Finding patterns:*

*How many squares would be shaped in the 6<sup>th</sup> shape in this sequence? How do you know?*

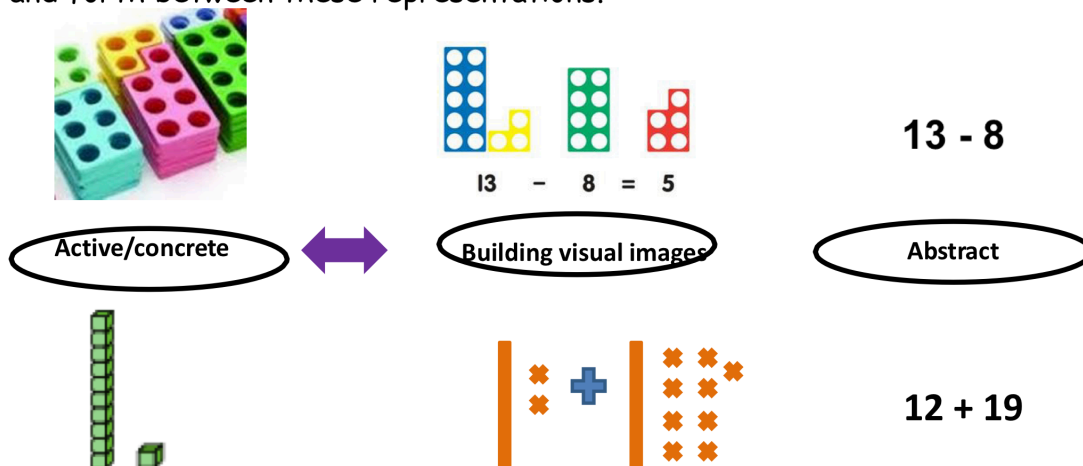


# How you can support at home



## 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.



# 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

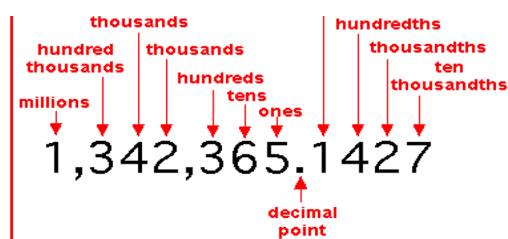
**Dividend** – The amount you want to divide up

**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



**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