



Urbis Academy Trust
Esse Optimus Qui Possum

Mayville Primary School

A Parent Guide to Mathematics (Year 2)



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

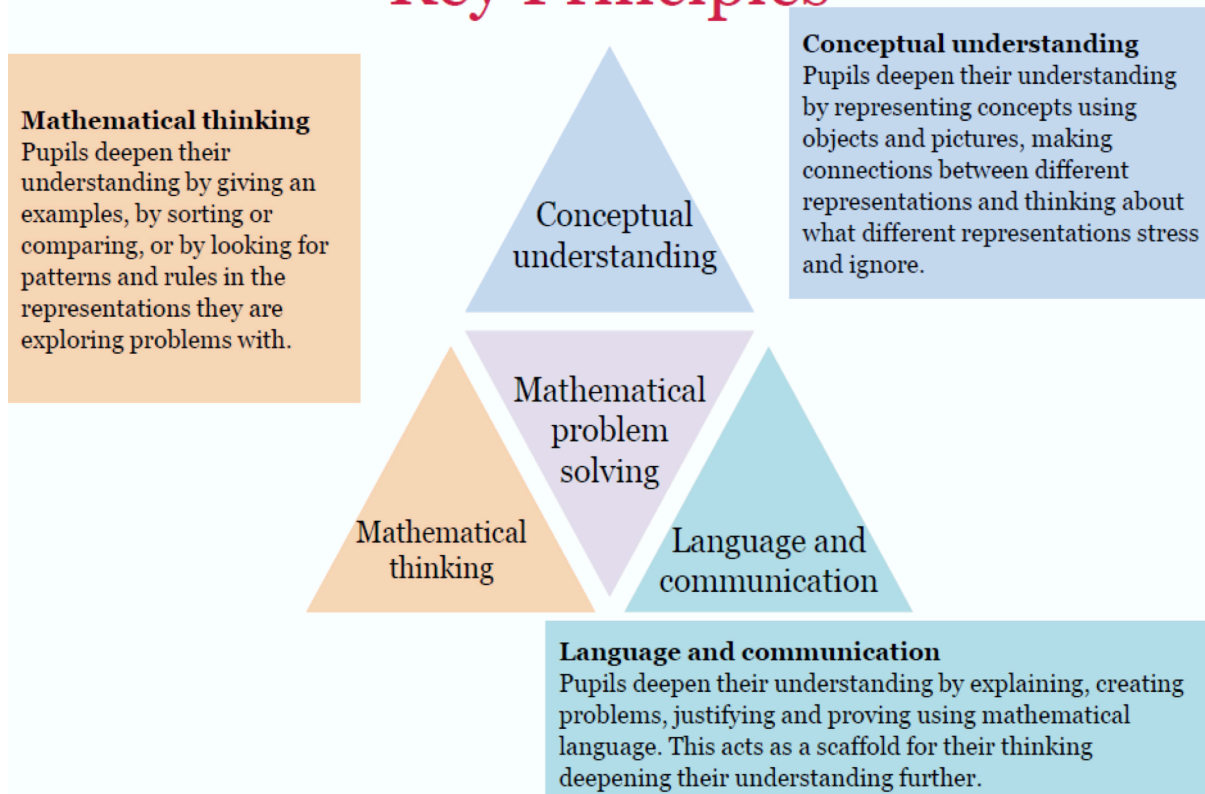
The content and principles underpinning the 2014 National Curriculum and the maths curriculum at Mayville reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Shanghai and South Korea.

- 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 2

During Key Stage 1, there is a big focus on developing basic number skills. That means securing a good understanding of place value, and recognising number bonds to 20. Practising the skills frequently will help children's mathematical thinking throughout school.

Number bonds are essential to the understanding of maths. Children in year two learn their number bonds to 20, that is being able to quickly recall the total of any two numbers up to 20, e.g. $5+9 = 14$, rather than having to count on to find the answer.

At the end of year two, all children will sit the national curriculum tests for key stage 1. This will include a short arithmetic test of 15 questions, and a second paper of broader mathematics which will last around 35 minutes.

Number and Place Value

- Recognise place value in two-digit numbers, e.g. knowing that the 1 in 17 represents 10
- Read and write numbers up to 100 as words
- Count in 2s, 3s and 5s
- Compare and order numbers up to 100
- Use the < and > symbols to represent the relative size of numbers

Calculations

- Recall number bonds up to 20 fluently
- Add and subtract numbers mentally and using objects, including two-digit numbers
- Show that adding two numbers can be done in any order, but subtracting cannot
- Recognise that addition and subtraction are inverse operations
- Learn the multiplication and division facts for the 2x, 5x and 10x tables
- Show that multiplying two numbers can be done in any order, but dividing cannot
- Solve problems using the x and \div symbols

Fractions

- Find $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of an object or set of objects
- Find the answer to simple fraction problems, such as finding $\frac{1}{2}$ of 6

Measurements

- Use standard units to measure length (centimetres and metres), mass (grams and kilograms), temperature (degrees Celsius) and capacity (millilitres and litres)
- Use the £ and p symbols for money amounts
- Combine numbers of coins to make a given value, for example to make 62 pence
- Tell the time to the nearest five minutes on an analogue clock
- Know the number of minutes in an hour and hours in a day

Shape

- Identify the number of sides and a line of symmetry on 2-d shapes
- Identify the number of faces, edges and vertices on 3-d shapes
- Use mathematical language to describe position and direction, including rotations and turns

Graphs and Data

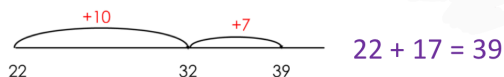
- Construct and understand simple graphs such as bar charts and pictograms

Parent Tip

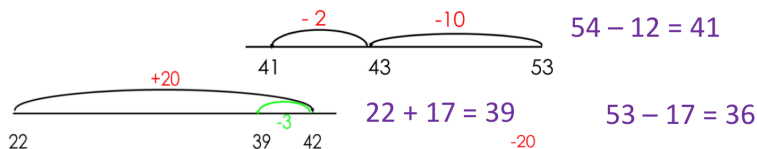
Parents can always take a lead role in practical maths. Encouraging your child to help with the purchasing of small items at the newsagent, or measuring themselves and others, is a great way to start exploring number relationships.

Addition & subtraction in Year 2

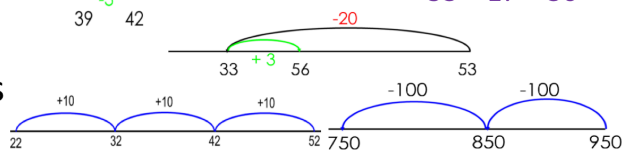
Partitioning one number



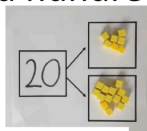
Rounding one number



Counting on in tens and hundreds



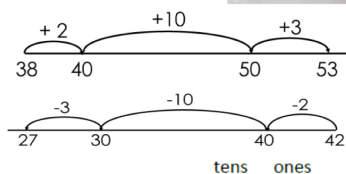
Part – part – whole



$$20 = 7 + 13$$

$$20 - 13 = 7$$

Make 10



$$38 + 15 = 53$$

$$42 - 15 = 27$$

hundreds tens ones

$$\begin{array}{r} 137 \\ - 18 \\ \hline \end{array}$$

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

$$\begin{array}{r} 137 \\ - 18 \\ \hline 119 \end{array}$$

Using known facts

$$3 + 4 = 7$$

$$30 + 40 = 70$$

$$300 + 400 = 700$$

$$8 - 4 = 4$$

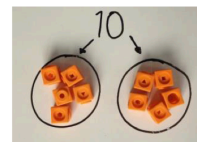
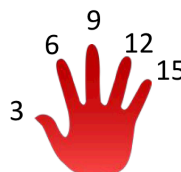
$$80 - 40 = 40$$

$$800 - 400 = 400$$

Multiplication & division in Year 2

Skip counting in multiples of 2, 3, 4, 5, 10 from zero

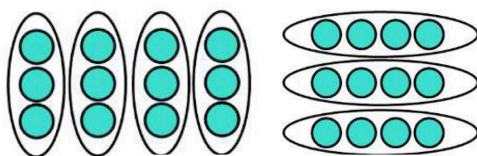
Dividing by sharing & grouping



Multiplication as repeated addition and division as repeated subtraction

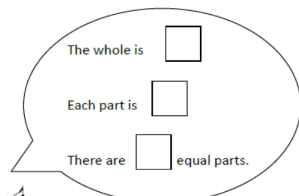
$$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = \square$$

Arrays & bar Models



4 groups of 3 is equal to 12
3 groups of 4 is equal to 12

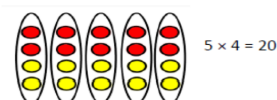
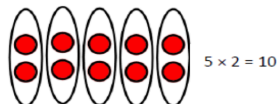
Part- part whole



$$15 \div 5 = 3$$

$$15 = 5 \times 3$$

Doubling to derive new multiplication facts



Standard Assessment Tasks (SAT's)

Compulsory national assessments in Years 2 and 6

| | Focus of Paper | Time Allowed | Number of Questions | Marks Available |
|---------|----------------|--------------|---------------------|-----------------|
| KS1 | | | | |
| Paper 1 | Arithmetic | 20 minutes* | 25 | 25 marks |
| Paper 2 | Reasoning | 35 minutes* | 31 | 35 marks |

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.



How you can support at home

How you can do Maths 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.

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.

Problem solving & Arithmetic

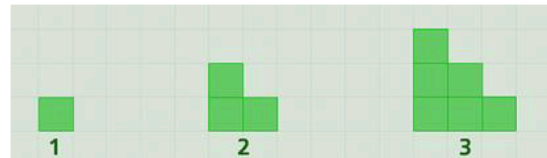


Word problems:

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?

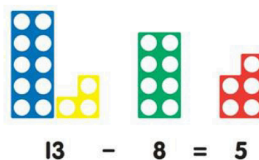


Mental arithmetic is an important life skill and regular practice is critical. Without fluency in mental maths to underpin their work in number, children will struggle with many other areas of mathematics. Children who are fluent with number will be able to use their mental arithmetic skills to find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



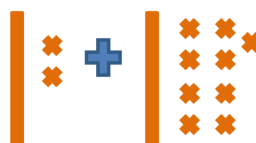
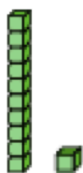
$$13 - 8$$

Active/concrete



Building visual images

Abstract



$$12 + 19$$

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

Concrete – Hands on, practical resources

Denominator – The bottom number in a fraction

Digit – A symbol used to make numerals 0-9

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

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'.

Remainder - The amount left over after division

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