

Maths Open Morning

4th February 2020
Miss Gorick
Maths Subject Leader

“Obvious” is the
most dangerous word
in mathematics.

-E.T. Bell

What we will cover...

- Maths no Problem
- How we teach Maths at St. Vincent's
- Progression of knowledge and skills
- How you can teach Maths at home
- Opportunity to see Maths being taught in all classes across the school



- **1980's-very poor performance** in international league tables
- Singapore Ministry of Education applied the best practice Research findings and applied them to their classrooms.
- Transformed their results.



Approach focus- building **problem-solving skills** and an **in-depth understanding** of essential Maths skills.

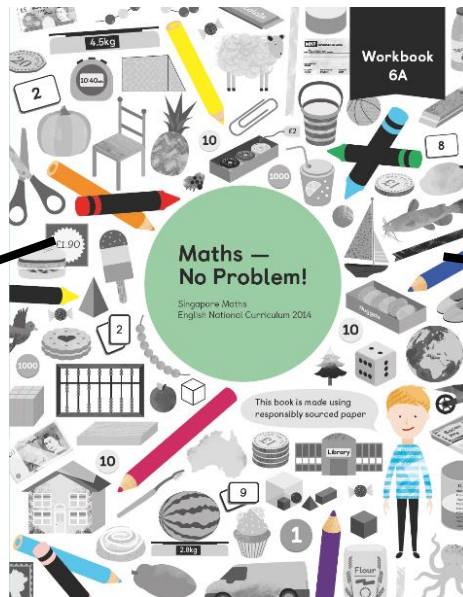
Maths No Problem (founded in 2007) helps schools teach the methods of Singapore Maths. It was assessed by the DfE's expert panel, which judged that it met the core criteria for a high-quality textbook to support teaching for **mastery**.

A visit to Shanghai



2014

- Department for Education Maths Research Project.
- The aim of the project was to enable English schools learn from the Asian-style mastery approach to maths.
- Build fluency and deepen understanding.



MASTERY QUESTION

By: EDTECH4BEGINNERS.COM

STARTERS

Can you draw... Prove that...

Teach your friend... Can you investigate...

Are you able to show me that... Why is that correct?

Can you explain your reasoning? How accurate is...

Find out how... Explore...

Can you show me another way? What would happen if...

What is Mastery?

Mastering maths means pupils acquiring a **deep, long-term, secure and adaptable** understanding of the subject.

For understanding in Maths to be secure, learning needs to be built on solid foundations.

-Skills of **resilience**

Lesson Structure

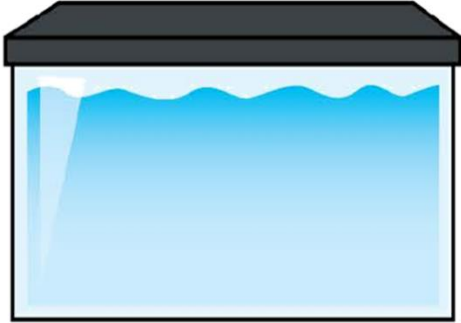
- **Starter-word** problem (discussion with learning partner)
- Share **learning objective**
- **Key learning**- children practise on whiteboards. Lots of discussion etc.
- **'Guided Practice'**-use of pictures, resources
- **Independent** learning
- Whole class **review**
- **Moved away** from grouping
 - High expectations
 - Challenge/support given if needed

Problem Solving

Problem solving is key to a mastery maths approach. Opportunities for problem solving are given for pupils to calculate with confidence.

- **Application** is vital-puzzles and problems
- **Explain/Reason** mathematically (clear thinking and methods).

A fish tank holds 30 litres of water.



The fish tank is $\frac{3}{5}$ full.

How much more water is needed to fill the tank?

- **Application**

- X tables
- Fractions
- Division

- **Explain/Reason**

- 'Show your working'
- Prove it

Progression of Knowledge and Skills

Our curriculum is designed to ensure **Progression of Knowledge and Skills** for each pupil as they move from Early Years to Upper Key Stage Two.

- Building skillset
- Revising and revisiting

Progression Maps and Learning Journeys

- Progression maps
 - Clear objectives
 - Yearly Overviews
- All children also have a Learning Journey:
 - Clear expectations
 - Clear targets
 - Website

| | | | | |
|---|---|--|--|--|
| <p>Fractions (including decimals and percentages)</p> | <ul style="list-style-type: none"> I can count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 I can recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators I can recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators I can recognise and show, using diagrams, equivalent fractions with small denominators I can add and subtract fractions with the same denominator within one whole [for example, $5/7 + 1/7 = 6/7$] I can compare and order unit fractions, and fractions with the same denominators I can solve problems that involve all of the above | <ul style="list-style-type: none"> I can recognise and show, using diagrams, families of common equivalent fractions I can count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. I can solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number I can add and subtract fractions with the same denominator I can recognise and write decimal equivalents of any number of tenths or hundredths I can recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ I can find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths I can round decimals with one decimal place to the nearest whole number I can compare numbers with the same number of decimal places up to two decimal places I can solve simple measure and money problems involving fractions and decimals to two decimal places | <ul style="list-style-type: none"> I can compare and order fractions whose denominators are all multiples of the same number I can identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths I can recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$] I can add and subtract fractions with the same denominator, and denominators that are multiples of the same number I can multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams I can read and write decimal numbers as fractions [for example, $0.71 = 71/100$] I can recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents I can round decimals with 2 decimal places to the nearest whole number and to 1 decimal place I can read, write, order and compare numbers with up to 3 decimal places I can solve problems involving number up to 3 decimal places I can recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction I can solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those fractions with a denominator of a multiple of 10 or 25 | <ul style="list-style-type: none"> I can use common factors to simplify fractions; use common multiples to express fractions in the same denomination I can compare and order fractions, including fractions > 1 I can add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions I can multiply simple pairs of proper fractions, writing the answer in its simplest form I can divide proper fractions by whole numbers I can associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction I can identify the value of each digit in numbers given to three decimal places I can multiply one-digit number with up to two decimal places by whole numbers I can use written division methods in cases where the answer has up to two decimal places solve problems which require answers to be rounded to specified degrees of accuracy I can recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |
| <p>Ratio & Proportion</p> | | | | <ul style="list-style-type: none"> I can solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts I can solve problems involving the calculation of percentages and the use of percentages for comparison I can solve problems involving similar shapes where the scale factor is known or can be found I can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. |
| <p>Algebra</p> | | | | <ul style="list-style-type: none"> I can use simple formulae I can generate and describe linear number sequences I can express missing number problems algebraically I can find pairs of numbers that satisfy an equation with two unknowns I can enumerate possibilities of combinations of two variables. |

Year 1

Subtract by Counting Back

Lesson 3

In Focus



There are 8 books in all.
3 books are on the table.



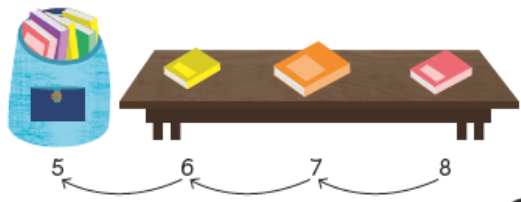
How many books are there in the bag?

Let's Learn

- I can add and subtract one-digit and two-digit **numbers** to 20

Subtract by Counting Back

$8 - 3 = ?$



Count back
3 steps from 8.

1 2 3 4 5 6 7 8 9 10



$8 - 3 = 5$

There are 5 books in the bag.



Subtract by Using Number Bonds

1



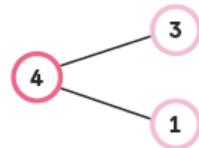
$$\begin{array}{rcccl} 4 & - & 3 & = & 1 \\ \text{whole} & & \text{part} & & \text{part} \end{array}$$

1 boy does not wear glasses.

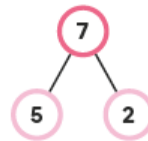
2



$$\begin{array}{r} 7 - 5 = 2 \\ 2 \text{ boats are not red.} \end{array}$$



How many boats
are not red?

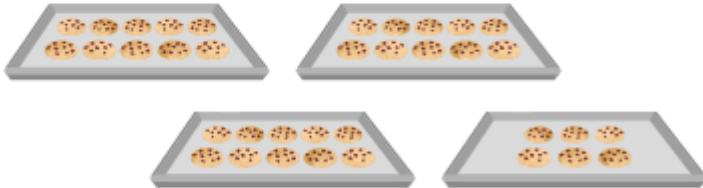


Year 2

Lesson 9

Simple Subtracting

In Focus



I give 20 cookies to my friends.



How many cookies are left?

Let's Learn

Subtract 20 from 36.

- I can add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
 - **two two-digit** numbers
 - **Choice**



Year 3

Simple Subtracting

In Focus

There were 975 beads in a jar.
Emma used 723 beads to make some necklaces.
How many beads were left in the jar?



Lesson 15

- I can add and subtract numbers with up to **three digits**, using **formal written methods** of columnar addition and subtraction

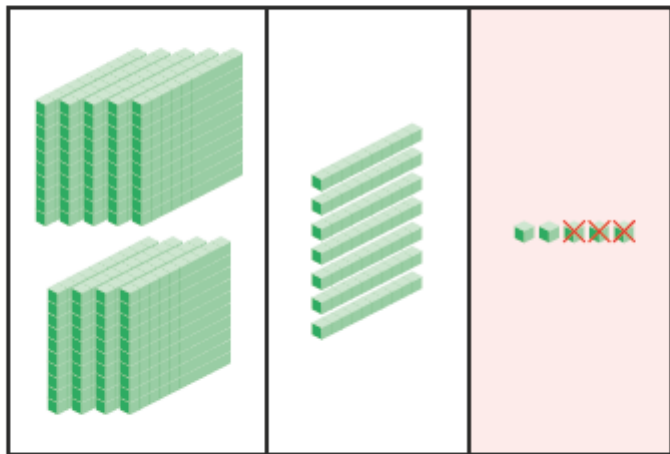
Let's Learn

Subtract 723 from 975.

Let's Learn

Subtract 723 from 975.

Step 1 Subtract the ones.
 $5 \text{ ones} - 3 \text{ ones} = 2 \text{ ones}$



| | h | t | o |
|-------|---|---|---|
| | 9 | 7 | 5 |
| - | 7 | 2 | 3 |
| <hr/> | | | 2 |
| <hr/> | | | |

Year 4

Subtracting with Renaming

Lesson 12

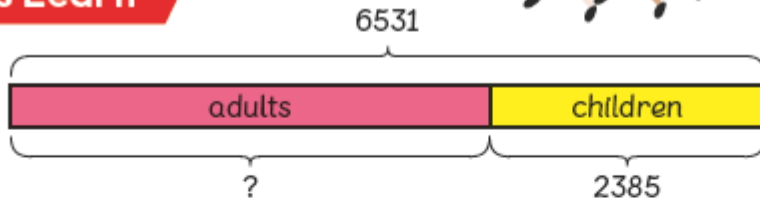
In Focus

6531 people signed up for a run.
2385 of them are children.
How many adults signed up?



Let's Learn

1



Subtract 2385 from 6531.

- I can add and subtract numbers **with up to 4 digits** using the **formal written methods** of columnar addition and subtraction where appropriate

Year 5

Lesson 10

Subtracting within 1 000 000

In Focus



Four pupils used the digit cards to make 5-digit numbers with the smallest difference.



| | | | | |
|---|---|---|---|---|
| 9 | 6 | 4 | 2 | 0 |
| 0 | 7 | 5 | 3 | 1 |



| | | | | |
|---|---|---|---|---|
| 8 | 0 | 1 | 2 | 3 |
| 7 | 0 | 0 | 5 | 1 |

- I can add and subtract whole numbers **with more than 4 digits**, including using **formal written methods** (columnar addition and subtraction)

Year 6





Solving Word Problems

Lesson 3

In Focus



took 1 h 50 min to bake first a sponge cake, then a butter cake and then a brownie. The butter cake took twice as long to bake as the brownie. The brownie took 10 minutes more than the sponge cake.

| | Baking time |
|---|---|
|  | twice as much time as  |
|  | 10 minutes more than  |

Is it possible to find the time it takes to bake a sponge cake?

Let's Learn

1

Understand

Plan

- I can solve **addition and subtraction multi-step problems** in contexts, deciding which operations and methods to use and **why**

How to teach Maths at home.

Practise little and often

- Times tables (key!) Songs, repetition
- Number bond facts (+ and -)
- Playing with numbers
- Asking your child to 'teach' you
- Maths in **everyday life**
 - **Shopping** (money, number, % discount during the sale)
 - **Measurement and estimation** (cooking, DIY!)
 - **Shapes**



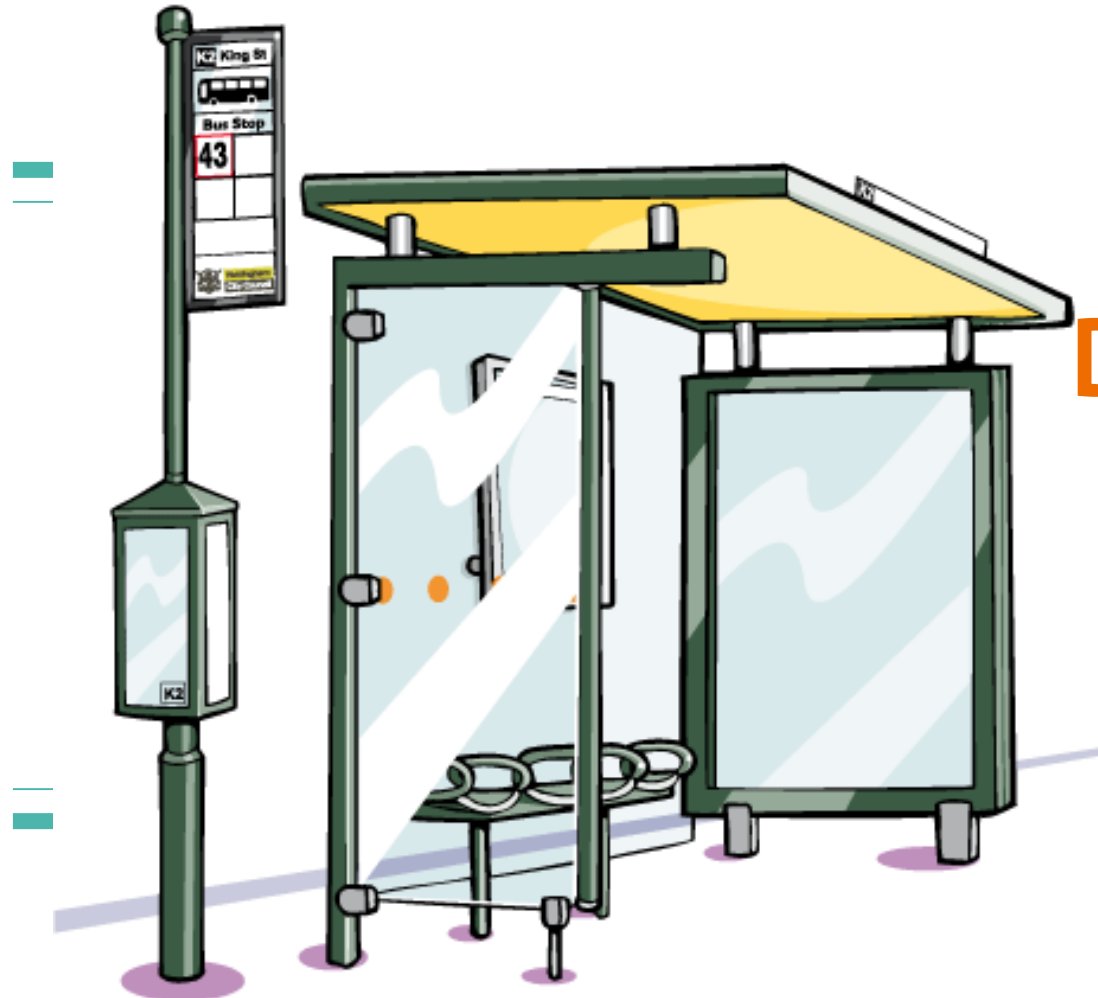
Videos for Parents.



Link: School website -> Curriculum & Ethos -> Home Learning

Link: School website -> Curriculum & Ethos -> Curriculum

<https://mathsnoproblem.com/en/parent-videos/>



Division- the
bus stop
method

$$159 \div 3 = 53$$

$$\begin{array}{r} 053 \\ 3 \overline{) 159} \end{array}$$

1 ÷ 3 = 0 remainder 1

Thank you for listening.

Any questions?



The only way to learn mathematics
is to do mathematics.

— *Paul Halmos* —