St Matthew's C of E Primary School

YEAR 6
CALCULATION POLICY

YEAR 6
MAIN PRINCIPLES

Scan QR codes to be directed to the MNP website with further information and videos.

What is maths mastery?

Teaching maths for mastery is a transformational approach to maths teaching which stems from high performing Asian nations such as Singapore. When taught to master maths, children develop their mathematical fluency without resorting to rote learning and are able to solve non-routine maths problems without having to memorise procedures.

Concrete, pictorial, abstract (CPA)

Concrete, pictorial, abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths. Developed by American psychologist, Jerome Bruner, the CPA approach is essential to maths teaching in Singapore.

Number bonds

Number bonds are a way of showing how numbers can be combined or split up. They are used to reflect the 'part-part-whole' relationship of numbers.

Bar modelling

The bar model method is a strategy used by children to visualise mathematical concepts and solve problems. The method is a way to represent a situation in a word problem, usually using rectangles.

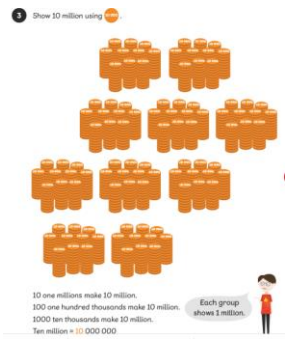
Fractions

In Singapore, the understanding of fractions is rooted in the Concrete, Pictorial, Abstract (CPA) model, where children use paper squares and strips to learn the link between the concrete and the abstract. At the heart of understanding fractions is the ability to understand that we're giving an equal part a name.

YEAR 6

PLACE VALUE

Value of digits – up to 10,000,000



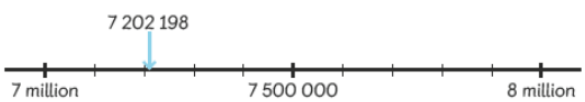
Place value chart

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
5	4	7	2	7	3	7

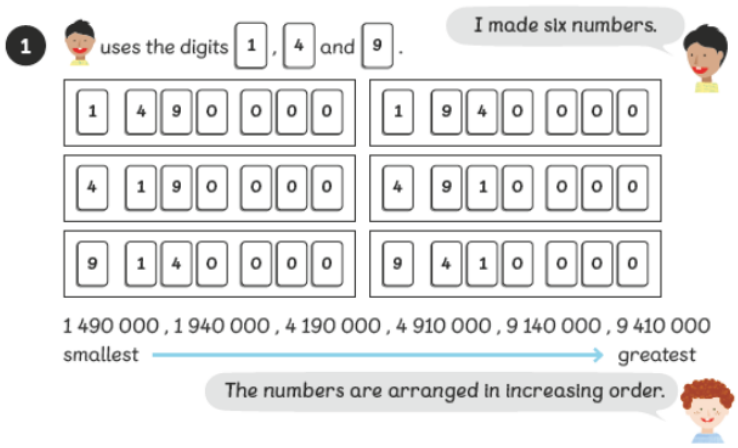
Comparing Numbers

Number lines and rounding



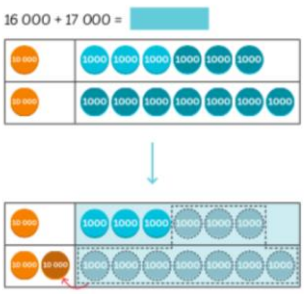
7 202 198 is closer to 7 million than to 8 million.
7 202 198 ≈ 7 million

Ordering Numbers



YEAR 6
ADDITION and SUBTRACTION

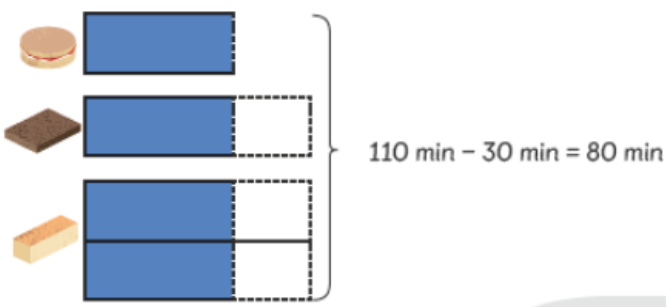
Using place value counters to support calculations



$$\begin{array}{r} 16\ 000 \\ +\ 17\ 000 \\ \hline \end{array}$$

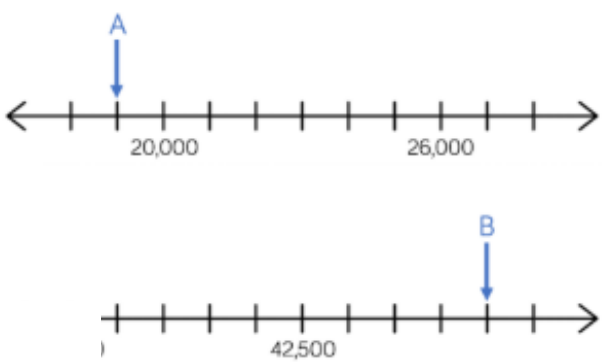
$$\begin{array}{r} {\scriptstyle 1}\ \ \\ 16\ 000 \\ +\ 17\ 000 \\ \hline 3\ 000 \end{array}$$

$$\begin{array}{r} {\scriptstyle 1}\ \ \\ 16\ 000 \\ +\ 17\ 000 \\ \hline 33\ 000 \end{array}$$



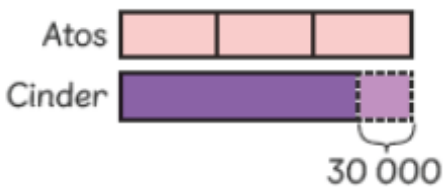
Number lines

Find the difference between A and B.



Bar Model

The population of Atos is 30 000 more than that of Cinder.



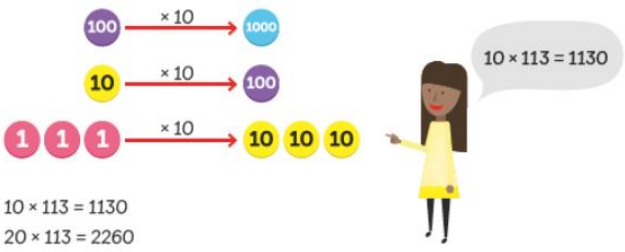
Formal calculation

£3.30 + £8.50 = £11.80

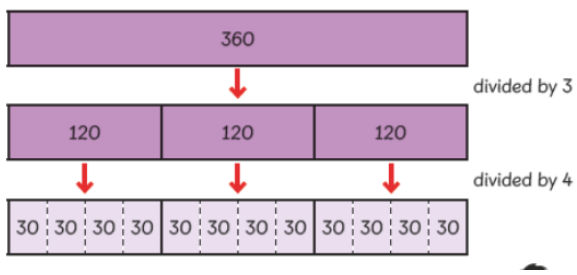
$$\begin{array}{r} £\ \ 3.30 \\ +\ £\ \ 8.50 \\ \hline £11.80 \end{array}$$

YEAR 6
MULTIPLICATION and DIVISION

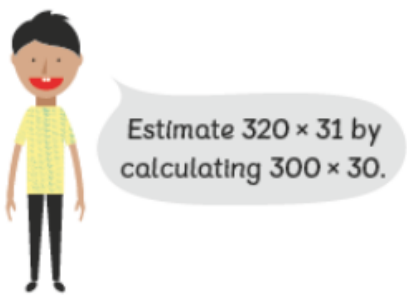
Using place value counters to support calculations



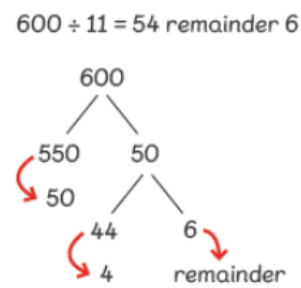
Bar Method



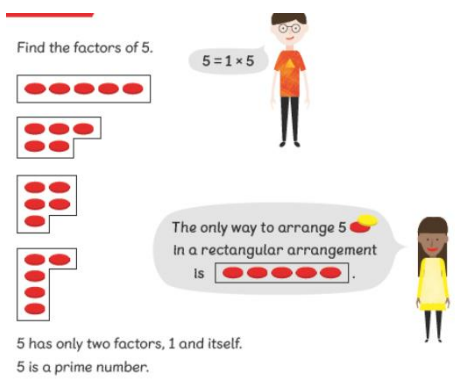
Estimating



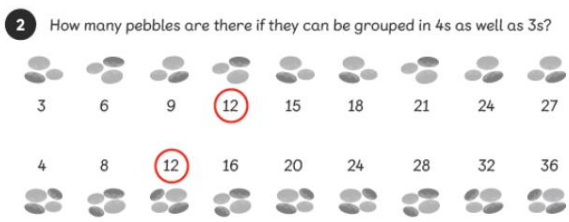
Partitioning



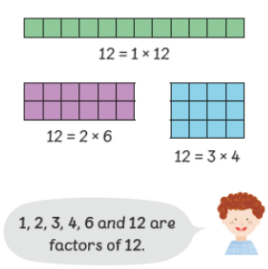
Prime Numbers



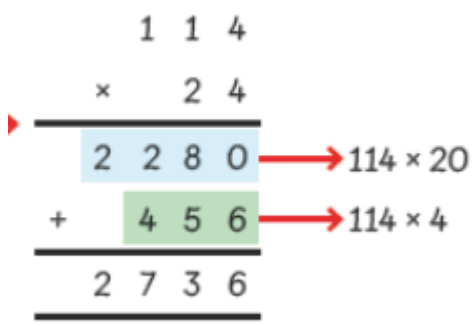
Common Multiples



Finding common factors



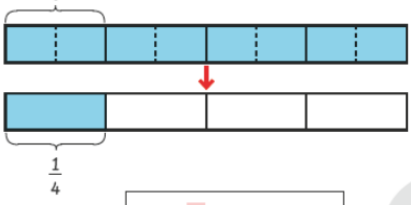
Formal methods



YEAR 6
FRACTIONS

Simplifying Fractions

1 $\frac{2}{8}$



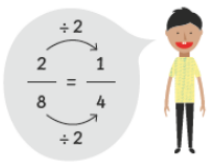
$\frac{1}{4}$

$\frac{2}{8} = \frac{1}{4}$

$2 = 1 \times 2$ $\quad 8 = 1 \times 8$

$8 = 2 \times 4$

2 is a common factor of 2 and 8.



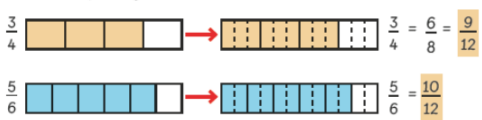
Comparing Fractions

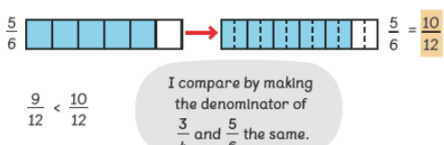
1 Compare $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{3}{4}$.

Using models

Making denominators the same

2 Compare $\frac{3}{4}$ and $\frac{5}{6}$.





$\frac{9}{12} < \frac{10}{12}$

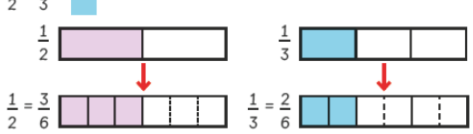
So, $\frac{3}{4} < \frac{5}{6}$

I compare by making the denominator of $\frac{3}{4}$ and $\frac{5}{6}$ the same.

Adding and Subtracting Fractions

1 How much pizza did  and  eat altogether?

$\frac{1}{2} + \frac{1}{3} = \square$



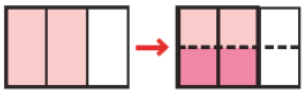
$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6}$

$= \frac{5}{6}$

They ate $\frac{5}{6}$ of a pizza altogether.

Using models

Multiplying Fractions



Using models

$\frac{1}{2} \times \frac{2}{3} = \frac{1}{2} \times \frac{4}{6}$

$= \frac{2}{6}$

$= \frac{1}{3}$

Same denominators

Method 1

$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6}$

$= \frac{5}{6}$

$2 - \frac{5}{6} = 1\frac{6}{6} - \frac{5}{6}$

$= 1\frac{1}{6}$

$1\frac{1}{6}$ of the pizza was left.

Dividing Fractions by a whole number

Hannah's method

$\frac{1}{2} \div 3$

$= \frac{3}{6} \div 3$

$= \frac{1}{6}$

$\frac{1}{2} = \frac{3}{6}$

Holly's method

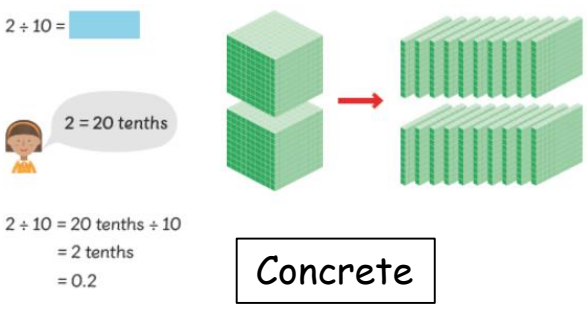
$\frac{1}{2} \div 3$

$= \frac{1}{3} \times \frac{1}{2}$

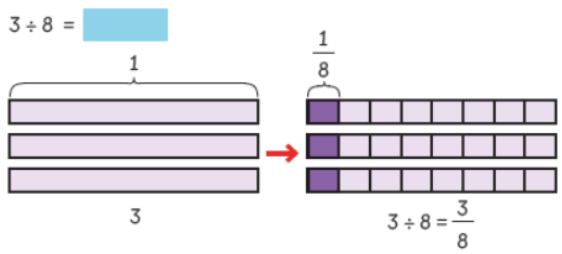
$= \frac{1}{6}$

YEAR 6
DECIMALS

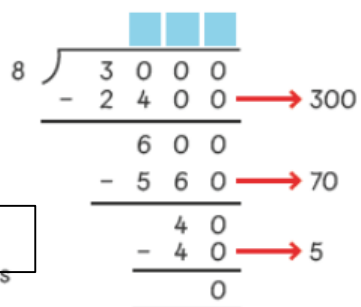
Divide whole numbers



Concrete

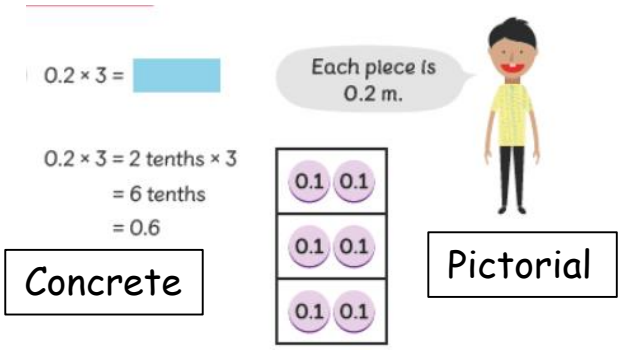


Pictorial



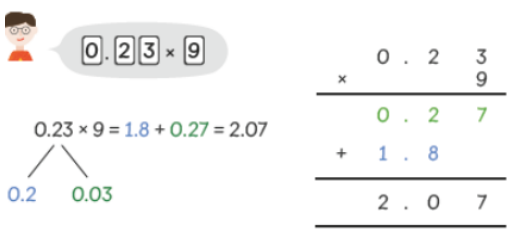
Abstract

Multiplying Decimals



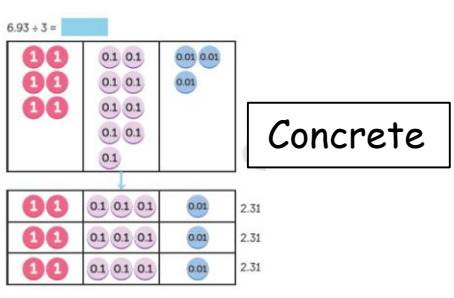
Concrete

Pictorial



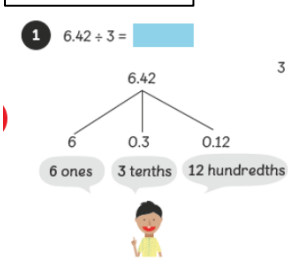
Abstract

Dividing Decimals



Concrete

Pictorial



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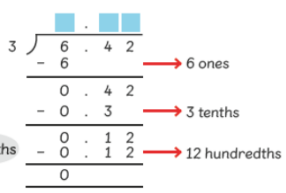
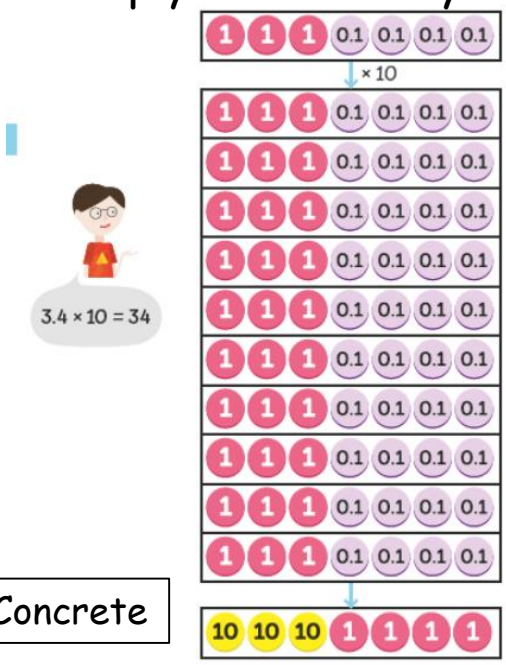


YEAR 6

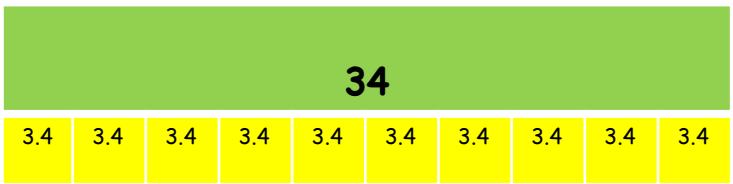
DECIMALS contd

Multiply decimals by a whole number

Concrete



Pictorial



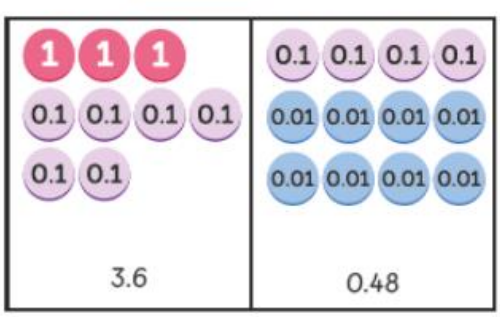
Abstract

$$\begin{array}{r} {\scriptstyle 3}\,3.4 \\ \times \quad 8 \\ \hline 27.2 \end{array}$$

Dividing Decimals by a Whole Number

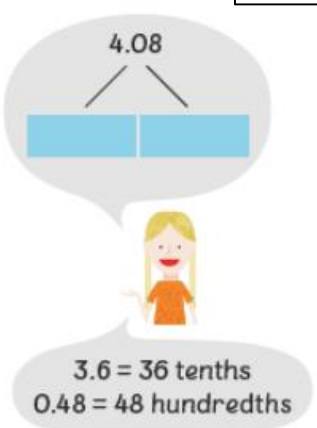
Concrete

1 4.08 ÷ 12 = ▭



36 tenths ÷ 12 = 3 tenths
= 0.3
48 hundredths ÷ 12 = 4 hundredths
= 0.04
4.08 ÷ 12 = 0.3 + 0.04
= 0.34

Pictorial



Abstract