



LOWER KEY STAGE 2

YEAR 3 & YEAR 4 MATHS WORKSHOP

1ST FEBRUARY 2024

AIMS OF TODAY

- To get a clear understanding of the Year 3 & Year 4 National Curriculum Expectations for Maths.
- To take away some ideas to support your child at home.
- To work through some of the problems that your children complete on a daily basis.

KEY AIMS OF THE MATHEMATICS NATIONAL CURRICULUM

- **Fluent recall of mental maths facts** e.g. times tables, number bonds. Etc.
- To **reason** mathematically - children need to be able to **explain** the mathematical concepts with number sense; they must explain **how** they got the answer and **why** they are correct.
- **Problem solving** - applying their skills to real-life contexts.

KEY DIFFERENCES OF NATIONAL CURRICULUM

- By the age of nine, children are expected to know **times tables up to 12×12** (used to be 10×10 by the end of primary school).
- **Simple fractions ($\frac{1}{4}$ and $\frac{1}{2}$) are taught from KS1**, and by the end of primary school, children should be able to convert decimal fractions to simple fractions (e.g. $0.375 = \frac{3}{8}$).

WHAT DO WE TEACH BY THE END OF PRIMARY? PROGRESSION IN ADDITION & SUBTRACTION

NUMBER BONDS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
MENTAL CALCULATION					
add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers 	add and subtract numbers mentally, including: <ul style="list-style-type: none"> * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds 		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				use their knowledge of the order of operations to carry out calculations involving the four operations

WHAT DO WE TEACH BY THE END OF PRIMARY? PROGRESSION IN ADDITION & SUBTRACTION

WRITTEN METHODS			
Year 3	Year 4	Year 5	Year 6
add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS			
estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

PROGRESSION IN MULTIPLICATION & DIVISION

MULTIPLICATION & DIVISION FACTS			
Year 3	Year 4	Year 5	Year 6
<i>count from 0 in multiples of 4, 8, 50 and 100</i> (copied from Number and Place Value)	<i>count in multiples of 6, 7, 9, 25 and 1 000</i> (copied from Number and Place Value)	<i>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</i> (copied from Number and Place Value)	
recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	recall multiplication and division facts for multiplication tables up to 12×12		
MENTAL CALCULATION			
write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
	recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</i> (copied from Fractions)

PROGRESSION IN MULTIPLICATION & DIVISION

WRITTEN CALCULATION			
Year 3	Year 4	Year 5	Year 6
write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
		divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
			<i>use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))</i>

PROGRESSION IN FRACTIONS

COUNTING IN FRACTIONAL STEPS				
Year 2	Year 3	Year 4	Year 5	Year 6
<i>Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (Non Statutory Guidance)</i>	count up and down in tenths	count up and down in hundredths		
RECOGNISING FRACTIONS				
recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
	recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
	recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
COMPARING FRACTIONS				
	compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

FRACTIONS CONTINUED...

ADDITION AND SUBTRACTION OF FRACTIONS			
Year 3	Year 4	Year 5	Year 6
add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
		recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	

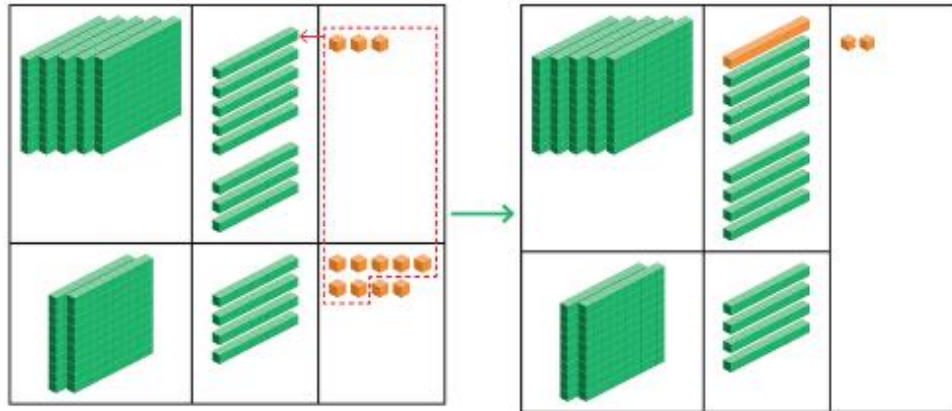
ADDITION METHODS WITH RENAMING

Master

$$583 + 249 = \square$$

Step 1 Add the ones.

$$3 \text{ ones} + 9 \text{ ones} = 12 \text{ ones}$$

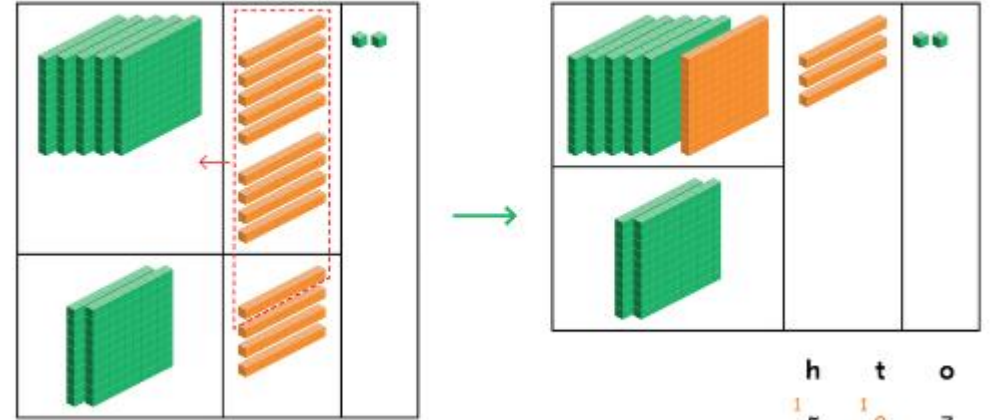


Rename the ones.
12 ones = 1 ten + 2 ones

	h	t	o
	5	¹ 8	3
+	2	4	9
			2

Step 2 Add the tens.

$$1 \text{ ten} + 8 \text{ tens} + 4 \text{ tens} = 13 \text{ tens}$$



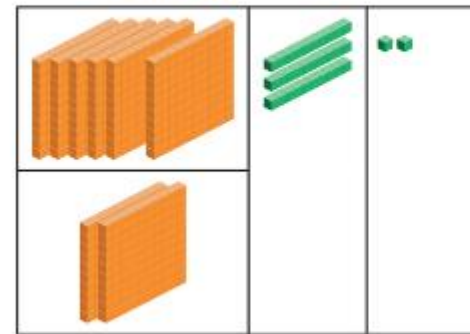
Rename the tens.

$$13 \text{ tens} = 1 \text{ hundred} + 3 \text{ tens}$$

	h	t	o
	¹ 5	¹ 8	3
+	2	4	9
		3	2

Step 3 Add the hundreds.

$$1 \text{ hundred} + 5 \text{ hundreds} + 2 \text{ hundreds} = 8 \text{ hundreds}$$



$$583 + 249 = 832$$

	h	t	o
	¹ 5	¹ 8	3
+	2	4	9
	8	3	2

HAVE A GO! Q3, 21, 33

SUBTRACTION METHOD WITH RENAMING

Master

$400 - 164 = \square$

Step 1 Rename 1 hundred as 10 tens.

h	t	o
4 ³	0 ¹⁰	0
- 1 6 4		

Step 2 Rename 1 ten as 10 ones.

h	t	o
4 ³	0 ⁹	0 ¹⁰
- 1 6 4		

Step 3 Subtract the ones.
10 ones - 4 ones = 6 ones

h	t	o
4 ³	0 ⁹	0 ¹⁰
- 1 6 4		

		6

Step 4 Subtract the tens.
9 tens - 6 tens = 3 tens

h	t	o
4 ³	0 ⁹	0 ¹⁰
- 1 6 4		

		6
3		

Step 5 Subtract the hundreds.
3 hundreds - 1 hundred = 2 hundreds

h	t	o
4 ³	0 ⁹	0 ¹⁰
- 1 6 4		

2		3 6

$400 - 164 = 236$

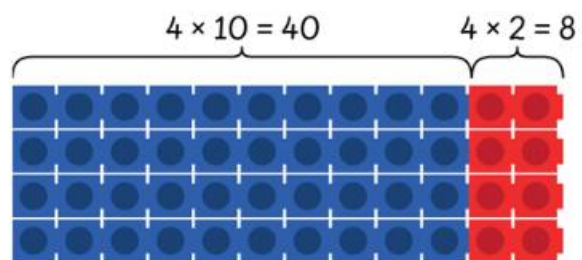
HAVE A GO! Q7,13,30

MULTIPLYING WITHOUT RENAMING

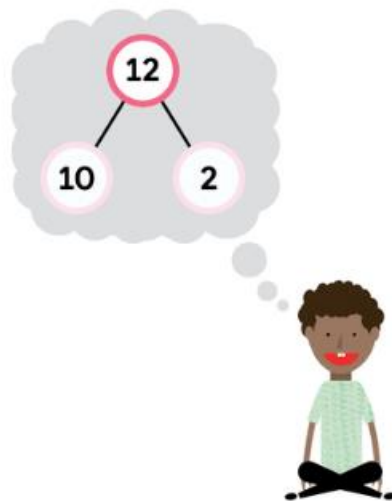
Master

1 $4 \times 12 =$

Method 1



$$\begin{aligned} 4 \times 12 &= 4 \times 10 + 4 \times 2 \\ &= 40 + 8 \\ &= 48 \end{aligned}$$



Method 2

Step 1 Multiply 2 ones by 4.

$$\begin{array}{r} 1 \ 2 \\ \times \ 4 \\ \hline 8 \end{array} \quad \longrightarrow \quad 2 \times 4 = 8$$

Step 2 Multiply 1 ten by 4.

$$\begin{array}{r} 1 \ 2 \\ \times \ 4 \\ \hline 8 \\ + \ 4 \ 0 \\ \hline 4 \ 8 \end{array} \quad \longrightarrow \quad 10 \times 4 = 40$$

10	1	1
10	1	1
10	1	1
10	1	1

MULTIPLYING WITH RENAMING

2

$$\begin{array}{r} 2 \quad 3 \quad 1 \quad 8 \\ \times \quad \quad 4 \\ \hline \quad \quad \quad 2 \end{array}$$

8 ones \times 4 = 32 ones
Rename the ones.
32 ones = 3 tens + 2 ones



Start by multiplying the ones.

$$\begin{array}{r} 2 \quad 3 \quad 1 \quad 8 \\ \times \quad \quad 4 \\ \hline \quad \quad 7 \quad 2 \end{array}$$

1 ten \times 4 = 4 tens
Add the tens.
4 tens + 3 tens = 7 tens



Multiply the tens.

$$\begin{array}{r} 2 \quad 3 \quad 1 \quad 8 \\ \times \quad \quad 4 \\ \hline 8 \quad 7 \quad 2 \end{array}$$

2 hundreds \times 4 = 8 hundreds
 $218 \times 4 = 872$



Multiply the hundreds.

HAVE A GO! Q26 & Q32

DIVIDING WITH & WITHOUT REMAINDERS

Method 1

$$\begin{array}{r}
 432 \\
 \swarrow \quad \searrow \\
 400 \quad 32 \\
 400 \div 4 \downarrow \quad 32 \div 4 \downarrow \\
 100 \quad \quad \quad 8 \\
 432 \div 4 = 100 + 8 \\
 = 108
 \end{array}$$

What is the quotient of $432 \div 4$?



Method 2

$$\begin{array}{r}
 1 \\
 4 \overline{) 432} \\
 \underline{- 400} \\
 32
 \end{array}$$

4 hundreds \div 4 = 1 hundred



$$\begin{array}{r}
 108 \\
 4 \overline{) 432} \\
 \underline{- 400} \\
 32 \\
 \underline{- 32} \\
 0
 \end{array}$$

32 ones \div 4 = 8 ones



$$432 \div 4 = 108$$

$$\begin{array}{r}
 \text{ remainder } \\
 4 \overline{) 102} \\
 \underline{- 80} \\
 22 \\
 \underline{- 20} \\
 2
 \end{array}$$

$80 = 2 \text{ tens} \times 4$
 $20 = 5 \text{ ones} \times 4$

$$102 \div 4 = 25 \text{ remainder } 2$$

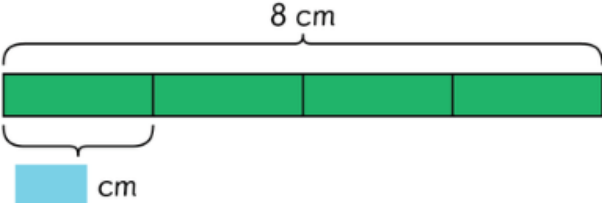
What is the quotient of $102 \div 4$?




HAVE A GO!
Q28 & Q36

FRACTION OF A NUMBER

Find $\frac{1}{4}$ of 8 cm.



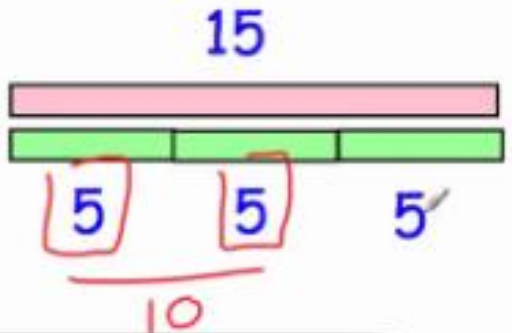
8 \div 4 =




There are parts of equal length.

$\frac{1}{4}$ of 8 cm = cm

$\frac{2}{3}$ of 15

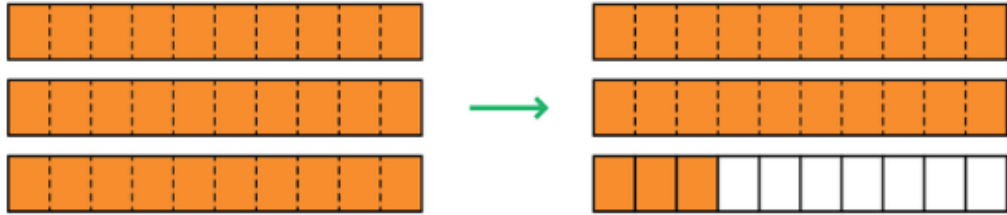


$15 \div 3 = 5$
 $2 \times 5 = 10$



HAVE A GO!
Q1 & Q34

ADDING & SUBTRACTING FRACTIONS



$$3 - \frac{7}{10} = \frac{30}{10} - \frac{7}{10} \\ = \frac{23}{10}$$

$$\frac{23}{10} = 2\frac{3}{10}$$

$$3 = \frac{30}{10}$$



$$1\frac{1}{5} - \frac{2}{5} = \frac{6}{5} - \frac{2}{5} \\ = \frac{4}{5}$$

HAVE A GO!
Q15 & Q23

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



MIXED NUMBER & IMPROPER FRACTIONS



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

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

HAVE A GO!
Q23

2 Use division to simplify $\frac{18}{12}$.

$$\frac{18}{12} \begin{array}{l} \xrightarrow{\div 2} \frac{9}{6} \\ \xrightarrow{\div 2} \end{array}$$

I can divide the numerator and denominator by 2. Can I simplify this fraction?

$$\frac{9}{6} \begin{array}{l} \xrightarrow{\div 3} \frac{3}{2} \\ \xrightarrow{\div 3} \end{array}$$

I can divide the numerator and denominator by 3.

$\frac{18}{12}$, $\frac{9}{6}$ and $\frac{3}{2}$ are also equivalent fractions.

MATHS AT HOME

- How to support your children at home:
- Support your children with their homework using these methods
- Continue to test your children on their knowledge of times tables as this links to many areas of Maths
- Ask them to explain what they have learned in Maths everyday

USEFUL WEBSITES

- www.Gascoigne.co.uk
- TTRockstar
- MyMaths - <https://login.mymaths.co.uk/login>
- <https://mathsframe.co.uk/www.bbc.co.uk/schools/bitesize>
- www.mathszone.co.uk
- <http://www.maths-games.org/time-games.html>
- <https://corbettmaths.com/>
- <https://www.khanacademy.org/>

ANY QUESTIONS

