Maths booklet for parents - Year 6

The 4 operations - the written methods

Falcon Junior School

2021

VISUALIZE

& MAKE CONNECTIONS

MATH IS ABOUT LEARNING, NOT PERFORMING

The maths curriculum

Falcon follows the National curriculum.
The national curriculum (2014) for mathematics aims to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- **Reason mathematically** by following a line of enquiry, guessing relationships and generalisations and developing an argument, justification or proof using mathematical language.

- **Solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

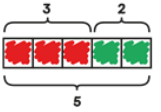
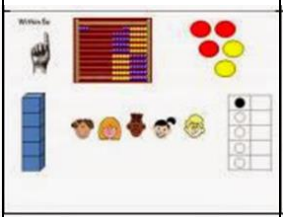
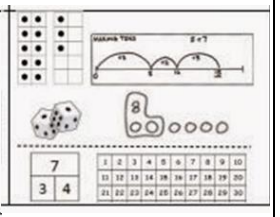
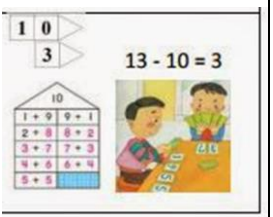
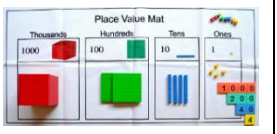
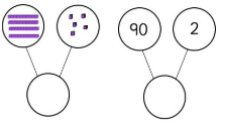
Year 6 objectives

The following table shows the expectations for the end of Year 6 for place value and the four operations.

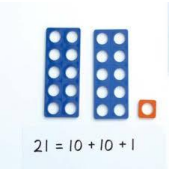
place value	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
	round any whole number to a required degree of accuracy
	use negative numbers in context, and calculate intervals across zero
	solve number and practical problems that involve all of the above
Addition / subtraction	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Multiplication/division	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 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
	divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
	identify common factors, common multiples and prime numbers
4 Operations	perform mental calculations, including with mixed operations and large numbers
	use their knowledge of the order of operations to carry out calculations involving the four operations

How we teach

Children (and adults!) can find maths difficult because it is abstract. Therefore, we build on children's existing knowledge by introducing abstract concepts in a physical and hands on way (concrete). We then move to drawing it (pictorial) before moving to recording it as numbers and symbols (abstract). We will also go back and forth between each stage to reinforce concepts.

Concrete	Pictorial	Abstract
		3 + 2 = 5
Children use hands-on, concrete materials	Children draw and look at diagrams	Children use and interpret numbers and mathematical symbols
		
		342 + 77 419 1

Place value



Place value is at the heart of the number system. Children need to understand this Base-10 system. It has 10 digits to show all numbers 0,1,2,3,4,5,6,7,8,9 and uses place value and a decimal point to separate whole numbers from decimal fractions. Each place is 10 times larger than the place to its right.

Millions			Thousands			Units				Decimals			
Hundreds of Millions 100 000 00	Tens of Millions 10 000 000	One Millions 1 000 000	Hundreds of Thousands 100 000	Tens of Thousands 10 000	One Thousands 1000	Hundreds 100	Tens 10	Units 1	Decimal Point	Tenths $\frac{1}{10}$ 0.1 or	Hundreths $\frac{1}{100}$ 0.01 or	Thousandths $\frac{1}{1000}$ 0.001	
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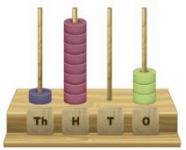
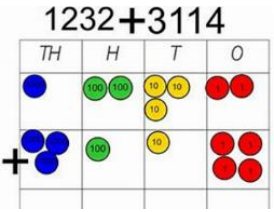
A secure understanding of this will enable children to see the relationship between the columns. Therefore, it is important that before we move to formal column methods of calculation we secure the understanding of place value.





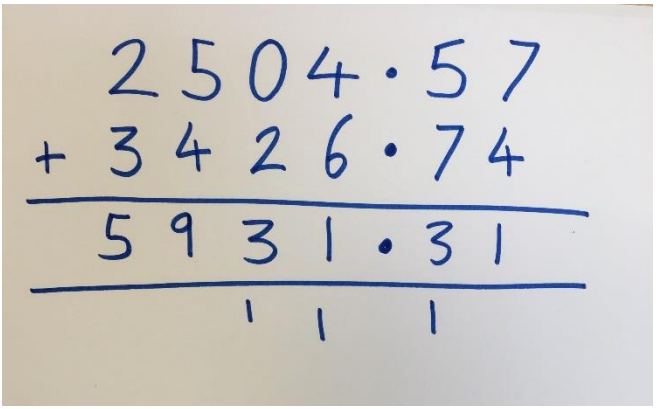
Addition

(Up to 6-digits, including up to 3 decimal places)

Compact column method

It is important to refer to place value; 5 hundreds add 4 hundreds equals 9 hundred rather than 5 and 4 is 9.

Any exchanges are recorded below the line.

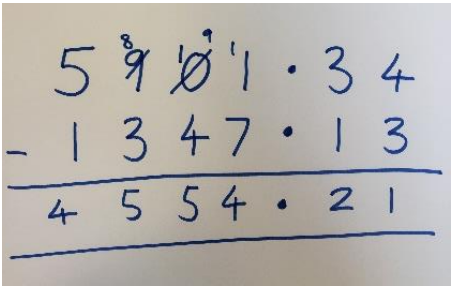


Subtraction

(Subtract from a 5-digit number, including 2 decimal places)

Formal column method

Show any exchanges as shown in the example.



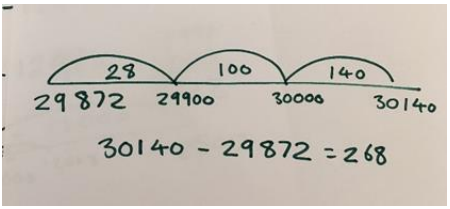
Other useful methods

Counting on (Find the difference)

Efficient method when number are close together or when subtracting from a multiple of 1000

Make logical jumps to total

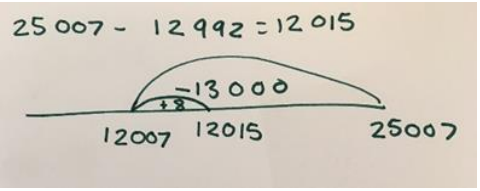
Then add jumps together to get the difference



Counting back and compensating

Another method when subtracting near multiples of 10/ 100

Take away more than you need and then add some back.



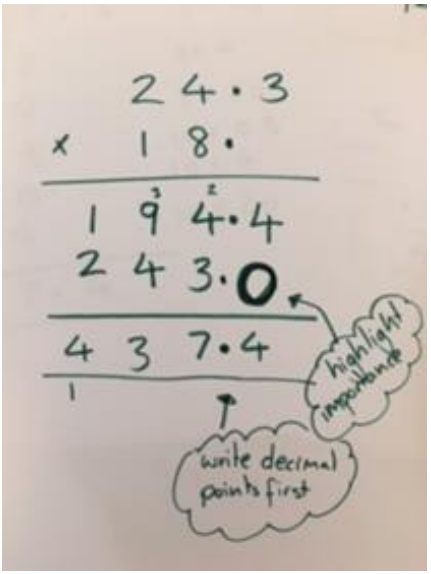
Multiplication

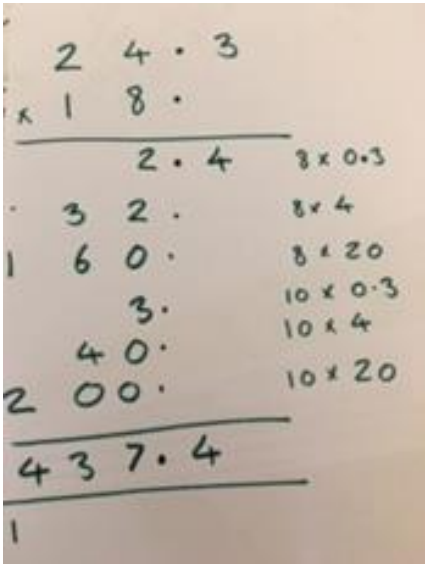
(4 by 2, including 2 decimal places)

<u>Compact column method</u>

Efficient method for larger numbers.

Add exchanges as you go across.





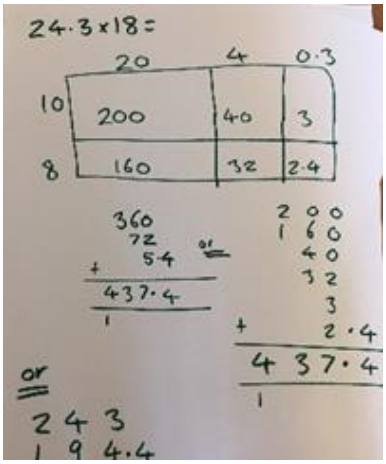
<u>Expanded column method</u>

Use if not secure using compact method. Record each step at a time, recording the calculation on the side.

Other methods

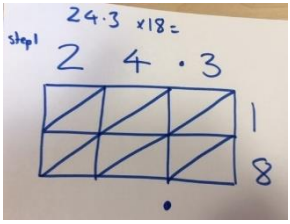
Empty array (Grid method)

Record answer in each section then add together.

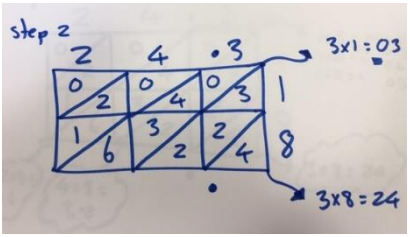


Lattice

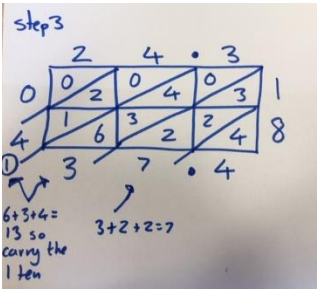
Use with caution as there is no real link to place value



Step 1 – draw a grid with numbers and decimal point if needed.



Step 2 – multiply the single digits and record as a 2 digit answer



Step 3 – add up each diagonal.

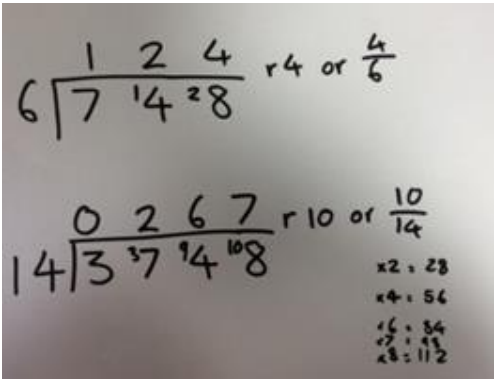
Answer is the digits around the edge = 437.4

Divison

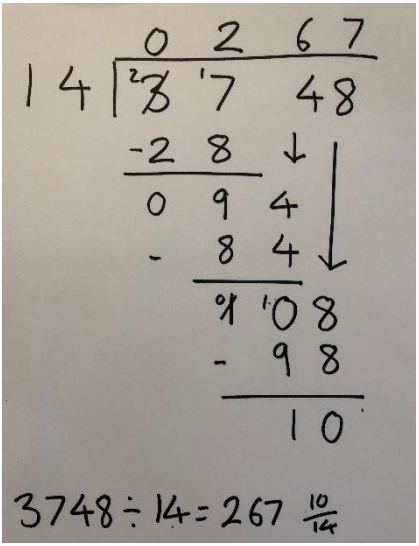
(Up to 5 digits by 2 digits, including decimals)

Use the language of grouping e.g. "How many groups of 6 can be made from 14 tens. Use fact boxes as a support, using skills like doubling to work out x4 and x8

Short division



Long division



Mental maths

Mental maths is the foundation maths is built on. Children need to regularly practice these skills to become fluent. If you want to support your child at home, practicing these will really help. Keep it fun and in short, regular bursts. Below is a list of some mental maths skills we focus on in Year 6.

Counting forwards/ backwards in different multiples, fractions, decimals and into negative numbers 0.02, 0.04, 0.06..... 4,2,0,-2,-4,.....
Half and double numbers, including near doubles 402 +398 = 800 Half of 2550 = 1275
X and ÷ by 10,100,1000 including decimals 2.3 x 10 = 23 23 ÷ 10 =2.3
Find the difference (mental subtraction) 3026 -2924 = 102 Count up from 2924 to 3026
To identify and use related times and division facts 2400 ÷ 6 = 400 use 24 ÷ 6 = 24
Composition of decimal numbers 0.06 = 0.01 +0.05
Round numbers to nearest hundredth, tenth, whole, 10 and 100. 24.367 →24.4 (nearest tenth) 24.37 (nearest hundredth)
Add and subtract numbers fluently 246 + 150 = 396 578 - 140 = 438
Use compensation -adding/ subtracting numbers that are close to a multiple of 10. 137 - 19 = 18 (137 - 20 then add 1)

Times tables

A secure knowledge and quick recall of times tables is essential to children's mathematical progress. The children are taught up to 12 X 12. It is very important that children practice their times tables daily at home.

When learning their tables, children are taught to look for patterns such as odd and even number answers, or patterns made by adding together the separate digits in the answers. Children are also taught to recognise the related facts so that knowing 6X7 = 42 means they know 7X6 = 42; 42 ÷ 6 = 7; 42 ÷ 7 = 6

The school has purchased the app Times Tables Rock Stars. Children can practise their weekly set times tables on Garage. They can also practise all the times tables on the games Studio and Sound Check. If they want to improve their rock status, they need to complete 10 games on Studio.

The aim for Year 6 is to become a **Rock Legend** (answering questions correctly in **under 2 seconds**).

How to help at home

1) Practise times tables **daily**

2) Regularly practise using the method on this booklet for arithmetic questions.

3) With your child, work through some past SATs questions

4) Discuss with your child, the strategies to use, and get them to explain their thinking as they work.

5) Identify what calculations can be done mentally and which need to been completed with a written method. For example:

Mentally

247.12 x 100 = 24712

8600 + 500 = 9100

640 ÷ 8 = 80

90000 – 2300 = 87700

Written

247.12 x 47 = 11614.64

8635 + 82596 = 91231

640 ÷ 16 = 40

9574.12 – 235.87 =9338.25

Useful websites

Past SATs test papers

https://www.gov.uk/government/collections/national-curriculum-assessments-practice-materials#key-stage-2-past-papers

Hit The Button (Quick fire maths practise)
https://www.topmarks.co.uk/maths-games/hit-the-button

Oxford Owl (multiplication facts)
https://www.oxfordowl.co.uk/for-home/kids-activities/fun-maths-games-and-activities/

Super movers (fun times table songs)
https://www.bbc.co.uk/teach/supermovers/ks2-maths-collection/z7frpg8

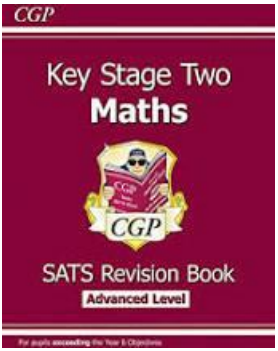
Top Marks (maths games)

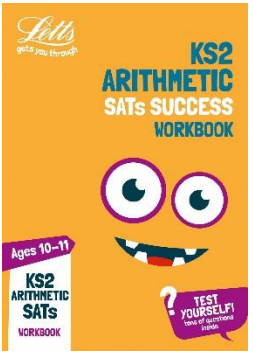
https://www.topmarks.co.uk/Search.aspx?Subject=16&AgeGroup=3

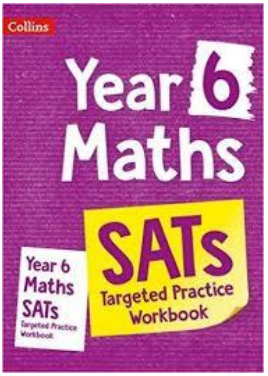
Crick web (maths games)

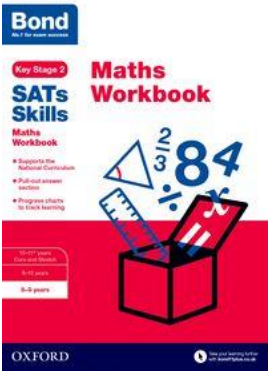
http://www.crickweb.co.uk/ks2numeracy.html

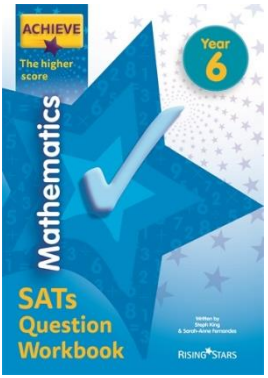
Useful workbooks

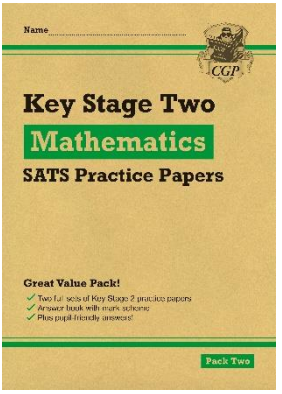












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