Maths booklet for parents – Year 4

The 4 operations

Falcon Junior School

2021

Understanding is more important than speed.

MISTAKES AND CHALLENGES ARE THE BEST TIME FOR YOUR BRAIN TO LEARN

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.

VISUALIZE

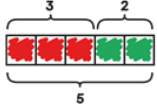**& MAKE CONNECTIONS**

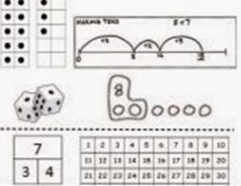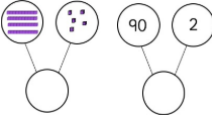MATH IS ABOUT LEARNING, NOT PERFORMING

Year 4 objectives

The following table shows the expectations for the end of Year 4 for place value and the four operations.

|	
place value	count in multiples of 6, 7, 9, 25 and 1000
	find 1000 more or less than a given number
	count backwards through zero to include negative numbers
	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
	order and compare numbers beyond 1000
	identify, represent and estimate numbers using different representations
	round any number to the nearest 10, 100 or 1000
	solve number and practical problems that involve all of the above and with increasingly large positive numbers
	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value
Addition /subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
	estimate and use inverse operations to check answers to a calculation
	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
Multiplication/division	recall multiplication and division facts for multiplication tables up to 12 × 12
	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
	recognise and use factor pairs and commutativity in mental calculations
	multiply two-digit and three-digit numbers by a one-digit number using formal written layout
	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

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
		$3 + 2 = \boxed{5}$
Children use hands-on, concrete materials	Children draw and look at diagrams	Children use and interpret numbers and mathematical symbols

Place value

$21 = 10 + 10 + 1$
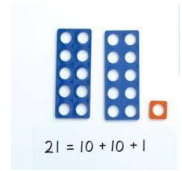
Place value is at the heart of the number system. Children need to understand this Base-10 system. It has 10 digits to show all numbers 0,1,2,3,4,5,6,7,8,9 and uses place value and a decimal point to separate whole numbers from decimal fractions. Each place is 10 times larger than the place to its right.

| Whole numbers					Decimal fraction	
Thousands	Hundreds	Tens	Ones	Decimal point	Tenths	Hundredths
1	2	4	5	.	6	3

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.
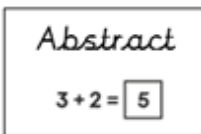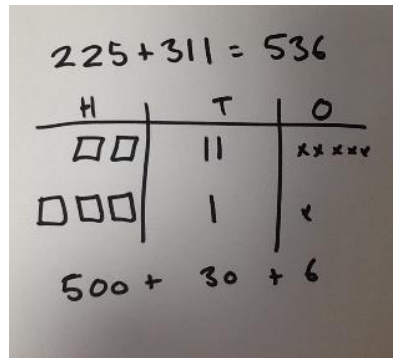

1000
800
3

1232+3114
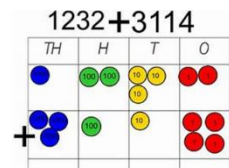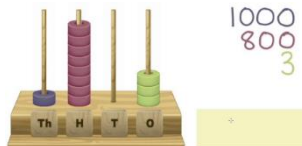
Addition (up to 4-digit numbers)

Concrete

We use Base 10 or place-value counters and partition the numbers into hundreds, tens and ones.

200   20   5

300   10   1

500 + 30 + 6 = 536

225 + 311 = 536

Pictorial
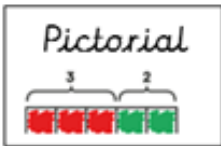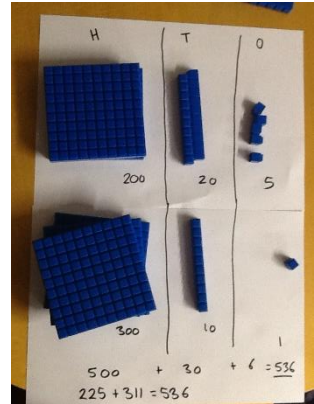
First, we draw the Base 10 using columns: Square = 100s   Line = 10s   Cross = 1s.   Then we record the total for each column.

$$225 + 311 = 536$$

H	T	O
□□	11	xx xxx
□□□	1	x

500 +   30 + 6

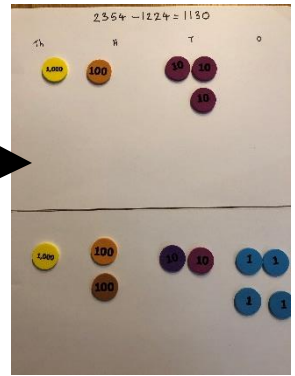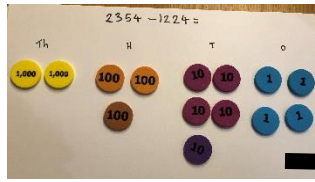### Abstract

$3 + 2 = \boxed{5}$

Once secure, they will then move onto the compact column method. Any exchanges are recorded below the line.

```
   2574
 + 1286
 ──────
   3860
 ──────
   1 1     ← show exchange here.
```
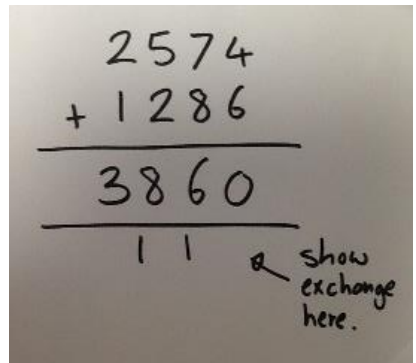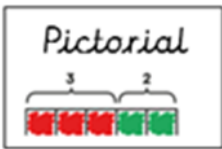
Subtraction

(Subtract from a 4-digit number)

Concrete

We use Base 10 or place-value counters.

Pictorial

$482 - 151 = 331$

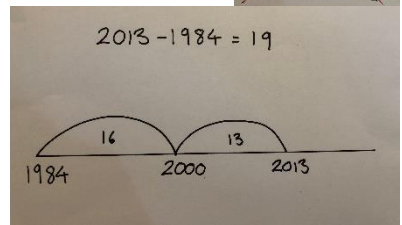**Abstract**

$3 + 2 = \boxed{5}$
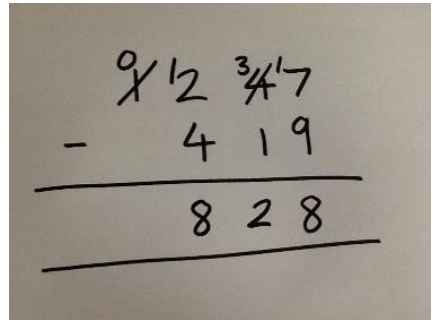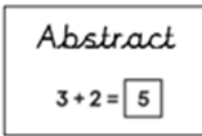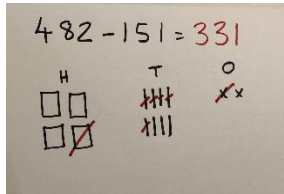
Formal column method
Record any exchanges
as shown in the
example.
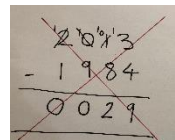
Find the difference
(number line)
We teach this as an alternative
to column subtraction,
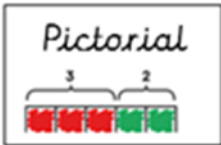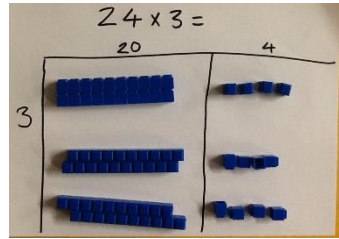especially where there is
multiple exchanges.

$2013 - 1984 = 19$
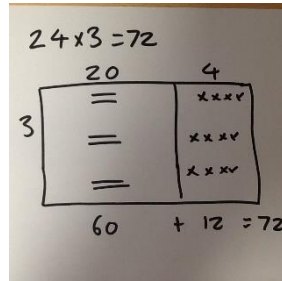
Multiplication
(2 by 2 digits and 1 by 3 digit)

Concrete

$24 \times 3 =$

Use base ten.
Partition tens and
ones first.

Pictorial

Draw as an array separating
the tens and ones

$24 \times 3 = 72$

$60 \quad + 12 = 72$

Empty array
Partition the tens
and ones.
Calculate then add
up each total.

Abstract

$3 + 2 = \boxed{5}$
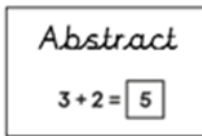
Expanded column method
Record each step at
a time.

$24 \times 35 = 840$

	20	4
30	600	120
5	100	20

$700 \quad + 140 = 840$

$24 \times 35 = 840$

```
    2 4
  × 3 5
  -------
    2 0    5 × 4
1 0 0    5 × 20
1 2 0    36 × 4
6 0 0    30 × 20
  -------
8 4 0
```
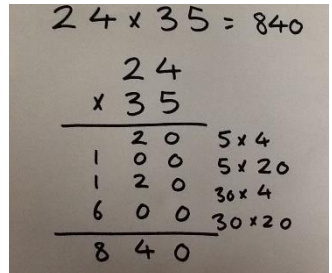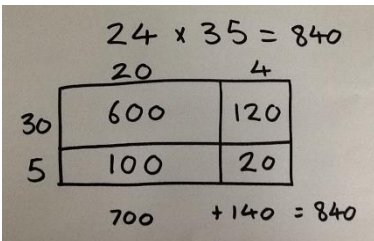
Divison (3-digit number by 1-digit)

Numberline (grouping)

The answer is the number of groups.

$30 - 4 = 6$

Concrete
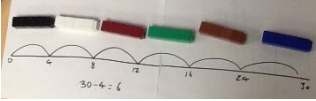
Bar model (Sharing)

The answer is the number in each group.

can't share, so exchange for ones.

Numberline (grouping)

Counting up in groups.

Pictorial
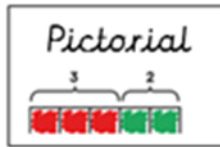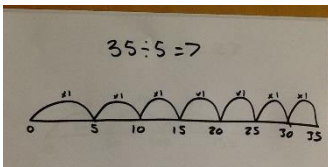
Bar Model (sharing)

Top bar is the total.
Bottom bar is the number of groups
If a larger number; share tens equally first.

$35 \div 5 = 7$

$135 \div 5 = 27$

1 = 10
x = 1
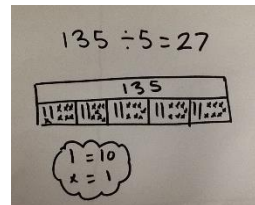
Number line (grouping)

Use bigger jumps i.e. jumps of x 10 to get to total. Use facts boxes as a support.

Abstract

$3 + 2 = \boxed{5}$
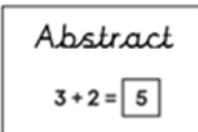
Bus stop (grouping)

Use the language of grouping e.g. "How many groups of 5 can be made from 13 tens. Use fact as a support.

$135 \div 5 = 27$

fact box
x1 = 5
x5 = 25
x10 = 50

fact box
x1 = 5
x2 = 10
x3 = 15
x4 = 20
x5 = 25
x6 = 30
x7 = 35
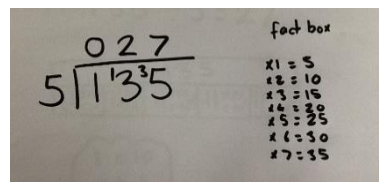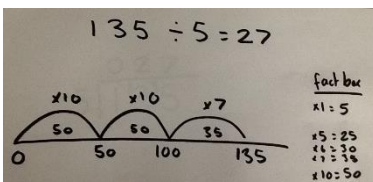
Mental maths

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 4.

Partitioning 4 digit numbers 4236 = 4000 +200 + 30 + 6
Counting forwards/ backwards in different multiples, fractions and decimals   0.1, 02, 03……   1/10, 2/10, 3/10 …….
Double and half numbers to 1000 Double 400 = 800   Half of 550 = 275
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 recall the times table and division facts up to 12 x 12.
Add and subtract time across the hour 8:45 plus 25 minutes = 9:10

Round numbers to nearest 10 and 100
            247 →250 (nearest ten)
                    200 (nearest hundred)

Add and subtract 3 digit numbers and multiples of 10 246 + 50 = 296   528 – 40 = 488

Times tables

A good knowledge and quick recall of times tables is essential to children's mathematical progress. The children are taught up to 12 X 12. The target is for all children to know their tables by the end of year 4. 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.

Useful websites

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

Oxford Owl (practise 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

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