Maths in UKS2

Calculations Policy for Parents

Wheatcroft Primary School

When teaching Mathematics as Wheatcroft, we intend to use a variety of teaching methods, strategies and resources that support all pupils and allow equal access to Mathematics.

This policy has been created to help you support your child at home with Maths. It shows the progression through different strategies for addition, subtraction, multiplication and division reflecting the Primary National Curriculum (2014). Recording in Mathematics is an important tool both for furthering the understanding of ideas and for communicating those ideas to others. A useful written method is one that helps children carry out a calculation and can be understood by others.

While this policy focuses on written calculation in mathematics, we recognise the importance of mental strategies and known facts that form the basis of all calculations. Pupils are provided with frequent opportunities to compare and evaluate different calculation strategies. This helps them develop an understanding that efficiency is personal and based on the numbers involved. Written methods are complementary to mental methods and should not be seen as separate from them. The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads, they use an efficient written method accurately and with confidence.

You can help your child's understanding by using practical methods and experimenting using toys, counters or objects like those illustrated. It is important for children to understand that Maths has a purpose and how it is used in everyday life. You can give them many of these opportunities at home.

Encourage your child to explain what they are doing. This will enhance their mathematical vocabulary as well as helping them to develop deeper understanding through enhancing their reasoning skills.

Addition

Year 5

NC Objectives

- To add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).
- To add and subtract numbers mentally with increasingly large numbers.
- To use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Models and Examples

Rounding to Estimate

£8.99 – 2.44 =

£8.99 ≈ £9.00

£2.44 ≈ £2.00

9 – 2 = £7

3.185kg + 6.821kg =

£3.185kg ≈ 3kg

6.821kg ≈ 7kg

3 + 7 = 10kg

Bar Model

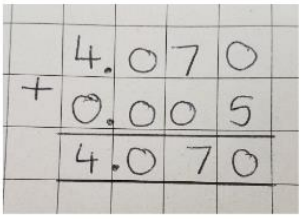
2.8 + 5.7 = 8.5

8.5	
2.8	5.7

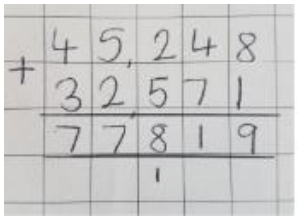
One exchange needed

Column Addition

No exchanging

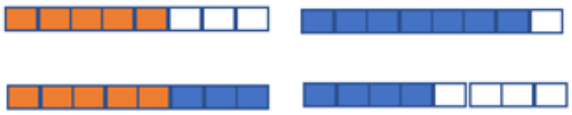


One exchange needed



Multiple exchanges needed

Adding Fractions



I drew 5 eighths and 7 eighths on bars.

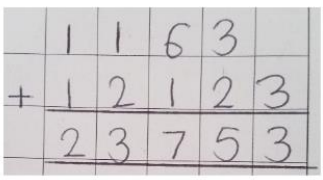
I can see 5 eighths and 7 eighths = 12 eighths.

12 eighths is 1 whole and 4 more eighths.

5/8 + 7/8 = 12/8 which is the same as 1 and 4/8

Misconceptions

As numbers get larger, children miscalculate because of a lack of understanding of the place value of numbers. e.g.



Encourage children to use their skills of estimation to check their calculation for reasonability. Also be aware that some children will not realise that they will have to add a 'carried' number.

Notes

As the children move on, decimals with the same number of decimal places can be introduced.
This method can also be used when adding money.

Key Vocabulary

add addition more plus increase sum total altogether score tens boundary hundreds boundary thousands boundary ones boundary tenths boundary inverse

Subtraction

Year 5

NC Objectives

- To add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).
- To add and subtract numbers mentally with increasingly large numbers.
- To use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Models and Examples

Rounding for Estimation

557,349 – 6353 =

If I round to the nearest thousand:

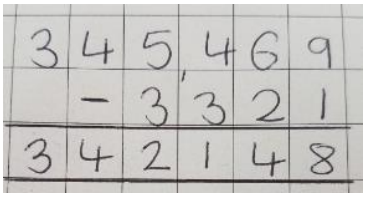
557,349 ≈ 557,000

6353 ≈ 6,000

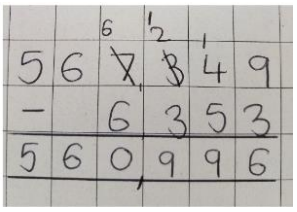
557,000 – 6,000 = 551,000

Column Subtraction

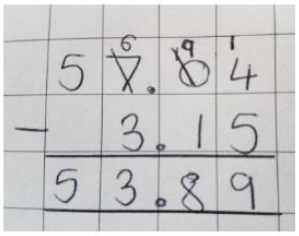
No regrouping



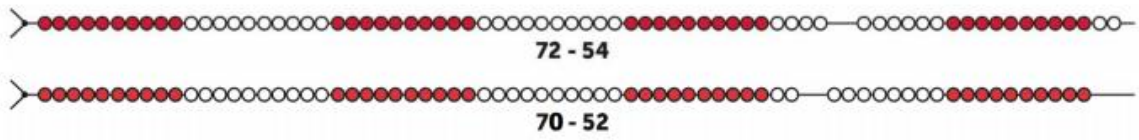
Regrouping required once



Regrouping required twice



Bead String (Equal Difference)



Near Multiples

567,000 – 3,999 =

567,000 – 4,000 = 563,000

Then + 1 to your answer = 563,001

Misconceptions

Children will have been taught to use a number line and should be able to visualise this mentally. Some pupils may fail to recognise the steps they need to take and fail to add up 'the steps' at the end. Misconceptions occur when decomposing from a 'high' number.
E.g. 9000 – 3654

Some pupils will attempt subtraction calculations using the formal written method, failing to recognise that it would be more efficient to calculate the answer mentally.

Notes

Children to continue using appropriate resources to support their reasoning skills.

Key Vocabulary

subtract subtraction minus decrease difference between inverse decimals ones tenths regroup column decomposition exchange

Multiplication

Year 5

NC Objectives

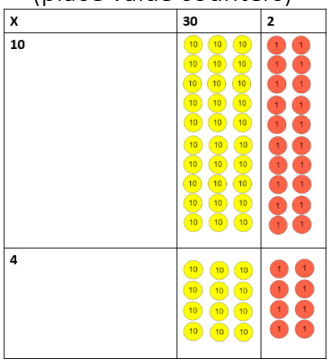
- To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- To establish whether a number up to 100 is prime and recall prime numbers up to 19.
- To 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.
- To multiply and divide whole numbers mentally drawing upon known facts.
- To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- To recognise and use square and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).
- To solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes.
- To solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning if the equals sign.
- To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

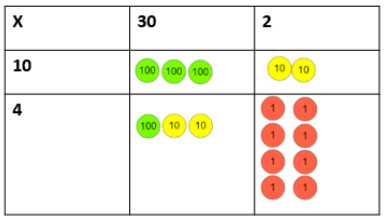
Models and Examples

<u>Expanded Vertical Multiplication (2-digit x 2-digit)</u>

32 x 14 = 448

Concrete
(place value counters)



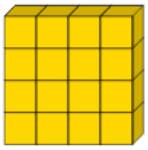


Pictorial – jottings
(grid method)

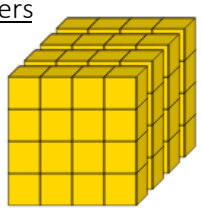
X	30	2	
10	300	20	= 320
4	120	8	= 128

Abstract
(written symbolic)

<u>Square and Cube Numbers</u>



4^2
= 4 x 4
= 16



4^3
= 4 x 4 x 4
= 64

<u>Multiplying by 10, 100, 1000</u>

35 x 10 = 350
35 x 100 = 3500
35 x 1000 = 35000

TTh	Th	H	T	O	.	1/10	1/100	
			3	5				
		3	5	0				(x10)
	3	5	0	0				(x100)
3	5	0	0	0				(x1000)

1.25 x 10 = 12.5
1.25 x 100 = 125
1.25 x 1000 = 1250

TTh	Th	H	T	O	.	1/10	1/100	
				1	.	2	5	
			1	2	.	5		(x10)
		1	2	5				(x100)
	1	2	5	0				(x1000)

Multiplication

Year 5

Misconceptions	Problems with place value can cause difficulties with written work. Children need to understand the connection between 6 x 3 and 60 x 3, understanding that the answer is 10x bigger because the number being multiplied is 10x bigger.
Notes	Using the grid method supports children in their thinking about multiplying by powers of ten and place value. Secure understanding of both of these concepts is needed to allow children to move to long multiplication more successfully. Key Vocabulary multiple times product factor square number cube number prime number factor pairs

Division

Year 5

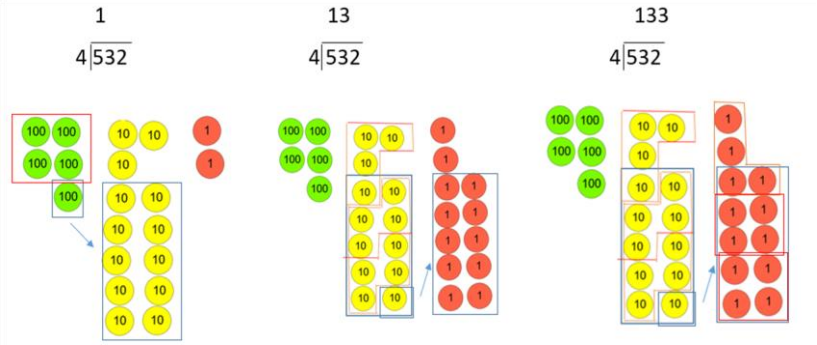
NC Objectives

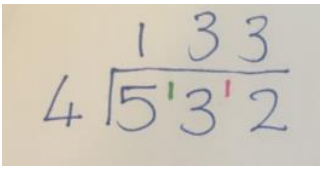
- To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- To establish whether a number up to 100 is prime and recall prime numbers up to 19.
- To multiply and divide whole numbers mentally drawing upon known facts.
- To 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.
- To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- To solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes.
- To solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning if the equals sign.
- To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Models and Examples

Short Division (supported by place value counters)

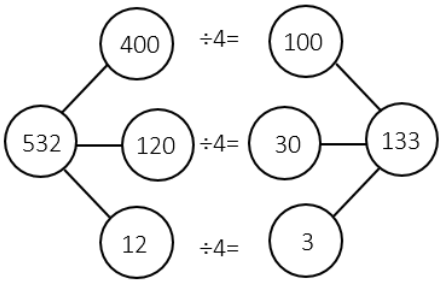
532 ÷ 4 = 133





Cherry Tree

532 ÷ 4 = 133



Dividing by 10, 100, 1000

275 ÷ 10 = 27.5

275 ÷ 100 = 2.75

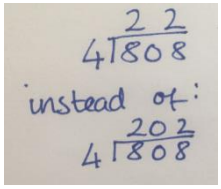
275 ÷ 1000 = 0.275

Th	H	T	O	.	1/10	1/100	1/1000	
	2	7	5					
		2	7	.	5			(÷10)
			2	.	7	5		(÷100)
			0	.	2	7	5	(÷1000)

Misconceptions

When using the inverse operation, children may not use the total at the start of the calculation.
E.g. 7 x ? = 56 should be 56 ÷ 7 =

When dividing children should start with the largest place value when using formal methods, which is the opposite to addition, subtraction and multiplication.



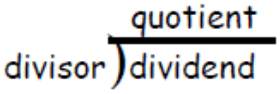
When there is a 0 in the dividend, it is sometimes forgotten and the use of 0 as a place holder is lost.

Notes

Children should have a solid knowledge of multiplication facts up 12 x 12 and be able to recall them with increasing speed. Children should be able to apply known number facts E.g. 18 ÷ 3 = 6 so 180 ÷ 3 = 60

Key Vocabulary

divide share quotient remainder multiple exchange inverse factor derive inverse divisor dividend



Fractions, Decimals Percentages

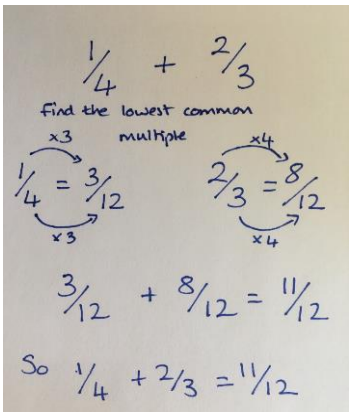
Year 5

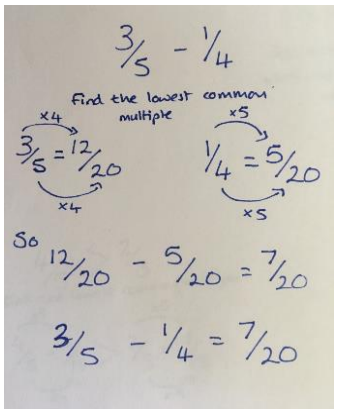
NC Objectives

- To compare and order fractions whose denominators are all multiples of the same number.
- To identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- To recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number. ($\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$)
- To add and subtract fractions with the same denominator and multiples of the same number.
- To multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- To read and write decimal numbers as fractions ($0.71=\frac{71}{100}$)
- To recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
- To round decimals with two decimal places to the nearest whole number and to one decimal place.
- To read, write, order and compare numbers with up to three decimal places.
- To solve problems involving numbers up to three decimal places.
- To recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100, and as a decimal.
- To solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.

Models and Examples

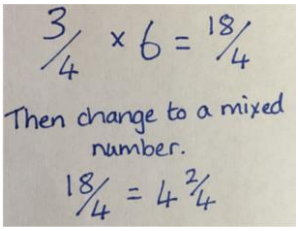
Adding and Subtracting Fractions with Different Denominators

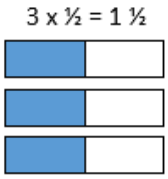




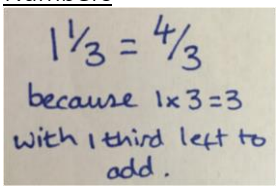
Multiplying Fractions by a Whole Number

Multiply the numerator by the whole number. The denominator stays the same.





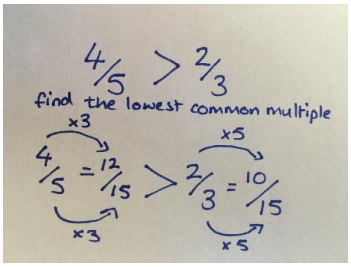
Converting Improper Fractions to Mixed Numbers



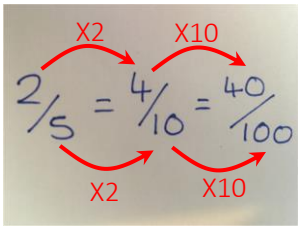
Multiply the denominator by the whole number and then add the numerator.

Comparing Fractions

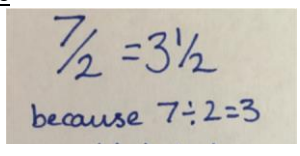
Make equivalent fractions with the same denominator.



Equivalent Fractions

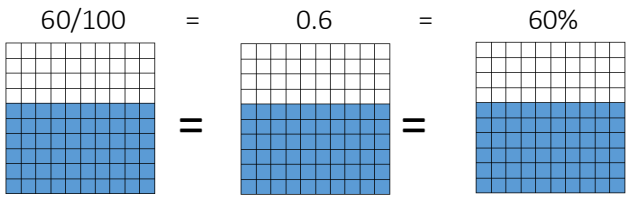


Converting Mixed Numbers to Improper Fractions



Divide the numerator by the denominator to calculate how many whole numbers. Put any remainders over the same denominator.

Fraction, Decimal, Percentage Equivalents



Fractions, Decimals Percentages

Year 5

Misconceptions

Understanding of Fractions
Children may misunderstand the function of the dividing line. They may add digits, combine them or get confused about the position of the decimal point.
E.g.. ¼ = 0.4 or 1.4

Understanding of Fractions
When adding fractions, children may misunderstand the function of the denominator and add them together.
E.g. 1/5 + 2/5 = 3/10

Place Value of Decimals
0.4 < 0.29
The child sees '4' as bigger than '29'.
Encourage use of extra 0s in spaces.
0.40 > 0.29

Understanding of Percentages
Children may assume numbers after the decimal point are a percentage and do not multiply by 100 when converting.
E.g. 0.125 = 125% or
0.5 = 5%

Notes

Children should be secure in their place value knowledge up to 3 decimal places. They should have a secure understanding of multiples and factors. Children should be able to multiply and divide by 10 and 100 across a decimal point.

Key Vocabulary

denominator numerator decimal point tenths hundredths thousandths equivalent lowest common multiple highest common factor simplify mixed number improper proper remainder percent % divisor

Addition

Year 6

NC Objectives

- To perform mental calculations, including with mixed operations and large numbers.
- To use knowledge of the order of operations to carry out calculations involving the four operations.
- To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- To solve problems involving addition, subtraction, multiplication and division.
- To use estimation to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.

Models and Examples

Order of Operations

BIDMAS

B	(brackets)
I	indices ^{2}
D	division ÷
M	multiplication x
A	addition +
S	subtraction -

BIDMAS tells us in which order to complete a calculation. We always complete brackets first, then indices, e.g. square or cube numbers. Multiplication and division are then equally as important, as are addition and subtraction.

60 ÷ (30 – 24) =

60 ÷ (30 - 24)

60 ÷ 6 = 10

Compensating

5.7 + 1.9 becomes 5.7 + 2 – 0.1

7.7 – 0.1

7.6

Multistep Problems involving Addition

John buys one toy car and a pack of stickers. He pays with a £10 note. How much change does he get?

£ 1. 4 9
+ £ 1. 6 4
£ 3.1 3
1 1

£ ~~1~~ ~~0~~ .~~0~~ ~~0~~
- £ 3.13
£ 6. 87

Estimation to Check

Use rounding to estimate answers.

£1.49 → £1.50

£1.64 → £1.50

Estimation of £1.49 + £1.64 → £3

£10 - £3 = £7 Therefore expect answer to be around £7.

Misconceptions

Order of Operations

Children may simply read number sentences from left to right and forget to apply the order of BIDMAS correctly.

E.g. 9 + 4 x 3 = 39

Multiplication should be completed first:

9 + 4 x 3 = 21

Column Addition Errors

Children may forget to carry or may mis-align place value columns, especially when using numbers with different amounts of decimal places. They may also add columns where none should exist.

```
  2 7 7
+   1 4 2
-------
  3 1 19

    3 4
+   1 8
-------
  4 1 2
```

Notes

Children use their previous knowledge of addition to solve more complex addition problems. Children can use resources to physically or pictorially explain their mathematical thinking.

Key Vocabulary

Sum total add increase plus altogether

Subtraction

Year 6

NC Objectives

- To perform mental calculations, including with mixed operations and large numbers.
- To use knowledge of the order of operations to carry out calculations involving the four operations.
- To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- To solve problems involving addition, subtraction, multiplication and division.
- To use estimation to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.

Models and Examples

Compensating

3.4 – 2.9 becomes 3.4 – 3 – 0.1 → 0.4 – 0.1 → 0.3

Estimating by Rounding and Using Inverse

3782 – 2136 =

Rounded to nearest 1000
4000 – 2000 = 2000
Rounded to nearest 100
3800 – 2100 = 1700

Calculate using formal written method

$$\begin{array}{r} 3\ 7\ {}^{7}\!\not{8}\ {}^{1}2 \\ -\ 2\ 1\ 3\ 6 \\ \hline 1\ 6\ 4\ 6 \end{array}$$

Use the inverse to check.

$$\begin{array}{r} 2\ 1\ 3\ 6 \\ +\ 1\ 6\ 4\ 6 \\ \hline 3\ 7\ 8\ 2 \\ \quad\ 1 \end{array}$$

Decimals (Using Zero as a Place Holder)

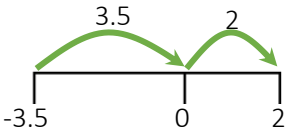
3.21 – 1.8 = 1.41

$$\begin{array}{r} {}^{2}\not{3}\ .\ {}^{1}2\ 1 \\ -\ 1\ .\ 8\ 0 \\ \hline 1\ .\ 4\ 1 \end{array}$$

The decimal point stays in line throughout the calculation. A zero is used as a place holder to ensure digits stay in the correct place.

Negative Numbers (Finding the Difference)

What is the difference between -3.5 and 2?



2 - -3.5 =

3.5 + 2 = 5.5

Solving Multi-step Problems

The numbers in this sequence **decrease** by the same amount each time.

303,604 *302,604* *301,604* *300,304* ...

What is the next number in the sequence?

$$\begin{array}{r} 303604 \\ -\ 302604 \\ \hline 001000 \end{array}$$

$$\begin{array}{r} {}^{2}3\ {}^{1}\!\not{0}\ 0604 \\ -\ \ 1000 \\ \hline 299604 \end{array}$$

Find out the common difference for the sequence by subtracting the second term from the first term.
It is decreasing by 1000 each time.
To find the next value in the sequence, subtract the common difference from the final term.

Misconceptions

Calculation Errors

$$\begin{array}{r} \text{tens}\ \ \text{ones} \\ 6\ \ 5 \\ -\ 2\ \ 7 \\ \hline 4\ \ 2 \end{array}$$

Children may subtract the smaller number from the larger number, regardless of where it appears in the calculation.

Notes

Children use their previous knowledge of addition to solve more complex addition problems. Children can use resources to physically or pictorially explain their mathematical thinking.

Key Vocabulary

minus decrease minuend (what we begin with) subtrahend (what is subtracted) difference (what is left after subtraction)

Multiplication

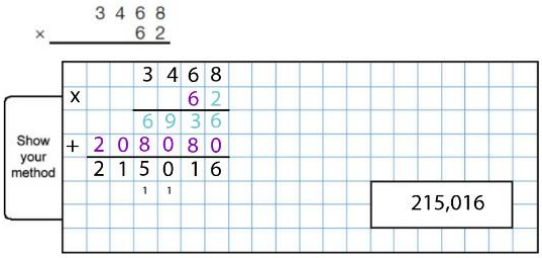
Year 6

NC Objectives

- To multiply multi-digit numbers up to 4-digits by a two-digit whole number using the formal written method of long division.
- To perform mental calculations, including with mixed operations and large numbers.
- To identify common factors, common multiples and prime numbers.
- To use knowledge of the order of operations to carry out calculations involving the four operations.
- To solve problems involving addition, subtraction, multiplication and division.
- To use estimation to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.

Models and Examples

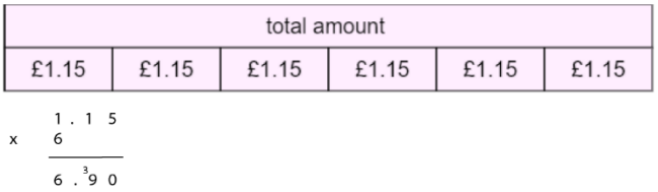
Multiplying 4-digit Numbers by 2-digit Numbers



First, 3468 is multiplied by 2, giving 6936. We then move to the row underneath, adding a 0 as a placeholder. We can then multiply 3468 by 6 instead of by 60, meaning this is easier to think about. The two products are added up to make the final answer at the bottom of the calculation.

Multiplying Numbers with up to 2 Decimal Places by Whole Numbers

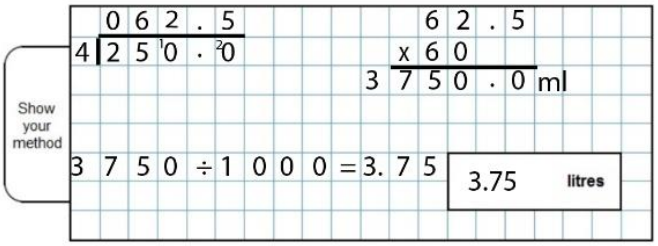
Laura buys 6 bags of sweets at £1.15 each. How much does she spend in total?



The bar model can help us here to understand what the question is asking us: to multiply 6 equal amounts to get an overall amount. The formal calculation is set out, multiplying the top numbers in turn from right to left by 6, carrying as necessary.

Solving Problems involving Multiplication

A machine pours 250 millilitres of juice every 4 seconds. How many **litres** of juice does the machine pour every **minute**?



First, we need to find out how much juice is poured in one second, so we divide by 4. We can then multiply this by 60 to find out how much is poured per minute: 3750ml. Finally, we need to convert to litres; we know that 1000l is 1l so we need to divide 3750 by 1000, giving us the final answer of 3.75L.

Misconceptions

When using columnar methods, children may add instead of multiplying. They may also work in the wrong direction or mis-align their columns.

Children can sometimes forget that it doesn't matter how small or large a number is, when they multiply by 1 the answer will always be that number, e.g. 3456 x 1 = 3456.

Similarly, whatever is multiplied by 0 will always be 0, despite how large the number may be, e.g. 5467 x0 = 0.

Notes

Children should know multiplication **but not division** follows the commutative law. This means that the order of multiplication can be changed but the product (answer) will be the same, e.g. 6 x 2 x 4 = 48; 4 x 2 x 6 is also 48. It doesn't matter how the numbers are grouped when multiplying; the product (answer) will be the same. (2 × 4) × 3 = 24 as does 2 × (4 × 3).

Key Vocabulary

multiple times product factor square number cube number prime number factor pairs common factor composite number

Division

Year 6

NC Objectives

- To 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.
- To 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.
- To perform mental calculations, including with mixed operations and large numbers.
- To identify common factors, common multiples and prime numbers.
- To use knowledge of the order of operations to carry out calculations involving the four operations.
- To solve problems involving addition, subtraction, multiplication and division.
- To use estimation to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.

Models and Examples

Identifying Common Factors

Factors of 54		Factors of 36	
1		1	
2	27	2	18
3	18	3	12
6	9	4	9
		6	

Factors are numbers which a number can be divided into evenly with no remainder. Common factors are numbers which appear when the factors for two or more numbers are listed. Children are taught to list these systematically for each number so ones appearing in both lists can be easily identified.

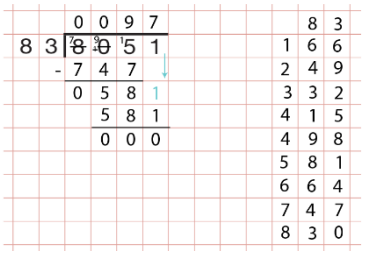
Prime Numbers and Multiples

Prime numbers are numbers which is only divisible by itself and 1, e.g. 2, 3, 5, 7, 11 etc. 1 is not considered a prime number.

Multiples are the product of two numbers multiplied together. To find common multiples, we teach children to list multiples systematically and then to identify numbers which appear in both lists.

Multiples of 4	Multiples of 12
4	12
8	24
12	36
16	48
20	60
24	72
28	84
32	96
36	108
40	120

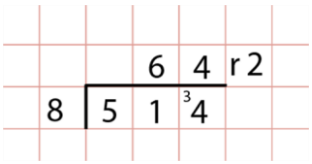
Divide up to 4-digit Numbers by 2-digit Numbers using the Formal Method (no remainders)



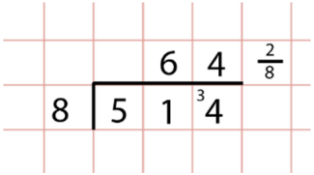
Children are taught to write the multiples of the number to be divided by (divisor – 83 here) next to the calculation. They then move along the dividend (amount being divided – 8051 here). They repeatedly subtract. When not enough remains to be subtracted, they then bring down the next place value digit (1 here). This allows the calculation to continue.

Divide up to 4-digit Numbers by 2-digit Numbers using the Formal Method (with remainders)

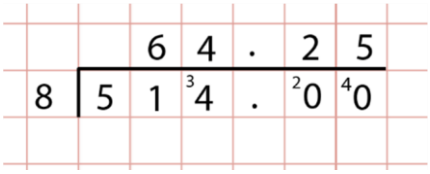
Simple remainder



Fraction remainder



Decimal remainder



Fraction: The remainder is written as a numerator in the answer; the denominator is the number being divided by, i.e. the divisor.

Decimal: Place a decimal point after the ones, then add 0 as a placeholder. Continue the calculation to give a decimal remainder.

Rounding Up or Down after Division: Remainders in Context

Plastic cups are sold in packs of 8. Amir needs 27 cups.

How many packs must he buy?

4 packs

27 ÷ 8 = 3r3

Amir needs to buy 4 packs (32 cups) and he will have some left over. If he bought 3 packs, he would not have enough.

There are 275 children in Fernley School. They get into groups of eight.

What is the largest number of groups of eight they can make?

34 groups

275 ÷ 8 = 34r3

= 34 groups with 3 left over. In this case, the question asks to round down.

Division

Year 6

Misconceptions

Children can often sometimes misread the symbol and multiply instead; they may also misread ÷ as – and subtract the amount.

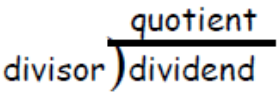
Children may become confused when dividing by a number itself to give 1, e.g. 5 ÷ 5 = 0 when actually it equals 1.

In longer calculations, children may forget to carry over the next digit, E.g. $\begin{array}{r} 22 \\ 2\overline{)54} \end{array}$ instead of giving the correct answer of 27.

Notes

Key Vocabulary

divide share quotient remainder multiple exchange inverse factor derive inverse divisor dividend



Fractions, Decimals Percentages

Year 6

NC Objectives

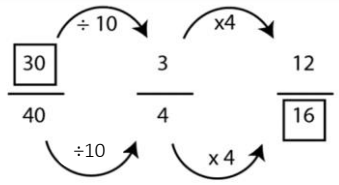
- To use common factors to simplify fractions and to use common multiples to express fractions in the same denomination.
- To compare and order fractions, including fractions >1.
- To add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
- To multiply simple pairs of proper fractions, writing the answer in its simplest form ($\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)
- To divide proper fractions by whole numbers ($\frac{1}{3} \div 2 = \frac{1}{6}$)
- To associate a fraction with division and calculate decimal fraction equivalents for a simple fraction ($0.375 = \frac{3}{8}$)
- To identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.
- To multiply one-digit numbers with up to two decimal places by whole numbers.
- To use written division methods in cases where the answer has up to two decimal places.
- To solve problems which require answers to be rounded to specified degrees of accuracy.
- To recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Models and Examples

Decimal Place Value

3 5 2 . 3 4 5

Finding Equivalent Fractions



Add and Subtract Mixed Numbers

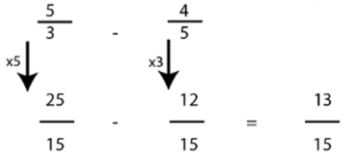
$1\frac{2}{3} - \frac{4}{5} =$

First, make the mixed number an improper fraction by multiplying the denominator by the whole number and adding the numerator.

1 x 3 = 3 3 + 2 = 5

$1\frac{2}{3} = \frac{5}{3}$

Next, using common multiples, make each fraction into fifteenths before subtracting. This answer cannot be simplified further.



Multiplying Decimals (Bar Model)

Laura buys 6 bags of sweets at £1.15 each.
How much does she spend in total?

Total Amount					
£1.15	£1.15	£1.15	£1.15	£1.15	£1.15

1 . 1 5
x 6
6 . 9 0
3

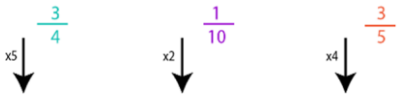
Multiplying Pairs of Fractions

1/4 x 1/2 = 1/8
Multiply the denominators, multiply the numerators then simplify if needed.

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

In this question, we are saying "What is half of a quarter?" → An eighth.

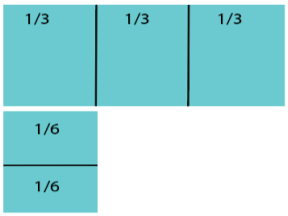
Comparing and Ordering Fractions



Convert to the same denominator using knowledge of multiples; we can now see clearly which fraction is worth the most.

Dividing a Fraction by a Whole Number

1/3 ÷ 2 = 1/6
Multiply the denominator by the whole number. (3 x 2 = 6)



Calculating Decimal Equivalents

3/8 = 0.375

$$8 \overline{)\,3.^{3}0^{6}0^{4}0} \quad 0.375$$

Fractions, Decimals Percentages

Year 6

Misconceptions

Different Denominators

When adding or subtracting fractions with different denominators, children may think they can simply add the denominators and numerators E.g. $\frac{1}{4}+\frac{1}{2}=\frac{2}{6}$. They must change the denominator to be the same.

Finding Equivalent Fractions

Children may muddle whether they need to or divide to get the appropriate equivalent.

Calculating with Percentages

Children may forget that 100% is the whole amount.

Comparing Fractions

Children may think where a number has a larger denominator that it is automatically worth more; this is not always the case. E.g. $\frac{3}{4}$ is worth more than $\frac{9}{30}$; this is because $\frac{9}{30}=\frac{18}{60}$ and $\frac{3}{4}=\frac{45}{60}$

Notes

Key Vocabulary

denominator numerator improper mixed number simplify equivalent decimal point tenths hundredths thousandths percent remainder