



Thanet Primary School

How we teach calculations Parent Booklet

Year 5

Addition

Subtraction

Multiplication

Division

ADDITION

Year 5 Add numbers with more than 4 digits



Including money, measures and decimals with different numbers of decimal places

E.g. £23.59 + £7.55

$$\begin{array}{r} 23.59 \\ + 7.55 \\ \hline \text{£ } 31.14 \end{array}$$

The decimal point should be aligned in the same way as the other place value columns and must be in the same column in the answer

$$\begin{array}{r} 23481 \\ + 1362 \\ \hline 24843 \end{array}$$

Numbers should exceed 4 digits

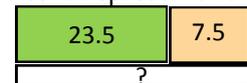
$$\begin{array}{r} 19.01 \\ + 3.65 \\ \hline 23.36 \end{array}$$

Children should be able to add more than two values, carefully aligning place value columns

Say "6 tenths add 7 tenths" to reinforce place value

'Empty' decimal places can be filled with zero (refer to this as a place holder) to show the value in each column

The bar model for addition continues to be used as a representation



Children should:

Understand the place value of tenths and hundredths and use this to align numbers with different numbers of decimal places

Solve multi-step problems involving addition in familiar contexts
Create their own real life, multi-step problems for others to solve

Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, „carry“, expanded, compact, vertical, thousands, hundreds, digits, inverse & **decimal places, decimal point, tenths, hundredths, thousandths**

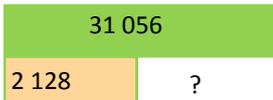
Key skills for addition at Y5:

- Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies ie. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds.
- Use rounding to check answers and accuracy.
- Solve multi-step problems in contexts, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Add numbers with more than 4 digits using formal written method of columnar addition.

Subtraction

Year 5 Subtract with at least 4-digit numbers

including money, measures, decimals.



Use the bar model as a visual representation

Compact column subtraction

including exchanging

$$\begin{array}{r}
 \overset{2}{\cancel{3}} \overset{10}{\cancel{1}} \overset{0}{\cancel{0}} \overset{5}{\cancel{5}} \overset{6}{\cancel{6}} \\
 - \quad \quad 2 \quad 1 \quad 2 \quad 8 \\
 \hline
 2 \quad 8, \quad 9 \quad 2 \quad 8
 \end{array}$$

Subtracting with larger integers.

Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point.

$$\begin{array}{r}
 \overset{6}{\cancel{7}} \overset{10}{\cancel{1}} \overset{6}{\cancel{6}} \overset{8}{\cancel{8}} \overset{0}{\cancel{0}} \\
 - \quad \quad 3 \quad 7 \quad 2 \quad \cdot \quad 5 \\
 \hline
 6 \quad 7 \quad 9 \quad 6 \quad \cdot \quad 5
 \end{array}$$

Create lots of opportunities for subtracting and finding differences with money and measures

Add a „zero“ in any empty decimal places to aid understanding of what to subtract in that column.

See NCETM Video

Approximate, Calculate,

Check it mate!

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse, tenths, hundredths, decimal point, decimal

Key skills for subtraction at Y5:

- Subtract numbers mentally with increasingly large numbers .
- Use rounding and estimation to check answers to calculations and determine, in a range of contexts, levels of accuracy .
- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 million.
- Interpret negative numbers in context, counting forwards and backwards with positive and negative integers through 0.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.

Video clip:

column subtraction <https://www.youtube.com/watch?v=3ihxp2mqnhs>

Multiplication

Year 5 Multiply up to 4-digits by 1 or 2 digits.



Introducing column multiplication

- Introduce by comparing a grid method calculation to a short multiplication method, to see how the steps are related, but notice how there are less steps involved in the column method (see video).
- Children need to be taught to approximate first, e.g. for 72×38 , they will use **rounding**: 72×38 is approximately $70 \times 40 = 2800$, and use the approximation to check the reasonableness of their answer against.

Short multiplication for multiplying by a single digit

x	300	20	7
4	1200	80	28



	3	2	7
x			4
	1	3	0
		2	8

Pupils could be asked to work out a given calculation using the grid, and then compare it to your column method. What are the similarities and differences? Unpick the steps and show how it reduces the steps

	10	8
10	100	80
3	30	24



	1	8
x	1	3
	5	4
1	8	0
2	3	4

18×3 on the 1st row

($8 \times 3 = 24$, carrying the 2 for twenty, then 1×3).

18×10 on the 2nd row. Put a zero in units first, then say 8×1 , and 1×1 .

The grid could be used to introduce long multiplication, as the relationship can be seen in the answers in each row.

	1	2	3	4
x			1	6
	7	4	0	4
1	2	3	4	0
	1	9	7	4

	3	6	5	2
x				8
	2	9	2	1
		5	4	

Approximate, Calculate,

Check it mate!

£24

£8	£8	£8	£8
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Remember to use the bar model to represent multiplication

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, _times as big as, once, twice, three times...
partition, grid method, total, multiple, product, inverse, **square, factor, integer, decimal, short/long multiplication, carry'**

Key skills for multiplication at Y5:

Identify multiples and factors, using knowledge of **multiplication tables to 12x12**.

Solve problems where larger numbers are decomposed into their factors

Multiply and divide integers and decimals by 10, 100 and 1000

Recognise and use square and cube numbers and their notation

Solve problems involving combinations of operations, choosing and using calculations and methods appropriately.

Video clips:

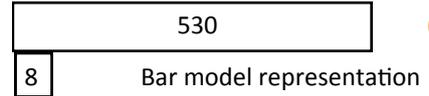
Moving from grid method to a compact method <https://www.ncetm.org.uk/resources/40530>

Reinforcing rapid times table recall: <https://www.youtube.com/watch?v=BcljRLZzMaw>

Demonstration of long multiplication https://www.youtube.com/watch?v=t_bnlB2KRL4

Division

Year 5 Divide up to 4 digits by a single digit, including those with remainders.



Short division, including remainder answers:

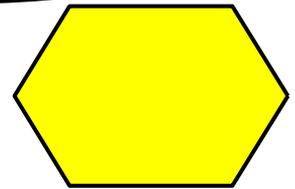
$$\begin{array}{r} 0663r5 \\ 8 \overline{)5309} \end{array}$$

The answer to $5309 \div 8$ could be expressed as **663 and five eighths**, **663 r 5**, as a decimal, or **rounded** as appropriate to the problem involved.

Include **money** and **measure** contexts

Short division with remainders: Now that children are introduced to examples that give rise to remainder answers, division needs to have a real life problem solving context, where **pupils consider the meaning of the remainder and how to express it**, i.e. as a fraction, a decimal, or as a rounded number or value, depending upon the context of the problem.

See Y6 for how to continue the short division to give a **decimal answer** for children who are confident.



Introduce **long division** for pupils who are ready to divide any number by a 2-digit number (e.g. $2678 \div 19$). This is a Year 6 expectation - see Y6

Key Vocabulary: share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, „carry“, remainder, multiple, divisible by, factor, inverse, **quotient, prime number, prime factors, composite number (non-prime)**

Key number skills needed for division at Y5:

- Recall multiplication and division facts for all numbers up to 12×12 (as in Y4).
- Multiply and divide numbers mentally, drawing upon known facts.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two number.
- Solve problems involving multiplication and division where larger numbers are decomposed into their factors.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Work out whether a number up to 100 is prime, and recall prime numbers to 19.
- 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
- Use multiplication and division as inverses.
- Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g. $98 \div 4 = 24 \text{ r } 2 = 24 \frac{2}{4} = 24.5 \approx 25$).
- Solve problems involving combinations of all four operations, including understanding of the equals sign, and including division for scaling by different fractions and problems involving simple rates.