

# Addition



## Year 5 Add numbers with more than 4 digits

including money, measures and decimals with different numbers of decimal places.

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

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

$$\begin{array}{r} 23,481 \\ + 1,362 \\ \hline 24,843 \end{array}$$

Numbers should exceed 4 digits.

$$\begin{array}{r} 19.01 \\ 3.65 \\ + 0.70 \\ \hline 23.36 \end{array}$$

Pupils 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 to show the  
place value in each column.

### Children should:

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

**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, 1000 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.

### Compact column subtraction

(with „exchanging“).

$$\begin{array}{r} \overset{2}{\cancel{8}} \overset{10}{\cancel{1}} \overset{0}{\cancel{0}} \overset{4}{\cancel{8}} \overset{6}{\cancel{6}} \\ - \quad 2 \quad 1 \quad 2 \quad 8 \\ \hline 2 \quad 8, \quad 9 \quad 2 \quad 8 \end{array}$$

Subtracting with larger integers.

Children who are still not secure with number facts and place value will need to remain on the partitioned column method until ready for the compact method.

See 'moving to the compact method' video.

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

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

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.

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 zero.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10,000 and 100,000.

### Video clip:

[Moving to the compact column method of subtraction \(youtube\)](#)

# 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  $72 \times 38$ , they will use **rounding**:  $72 \times 38$  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



$$\begin{array}{r} 327 \\ \times \quad 4 \\ \hline 1308 \\ \phantom{1} \phantom{2} \phantom{0} \phantom{8} \\ \phantom{1} \phantom{2} \phantom{0} \phantom{8} \end{array}$$

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.

### Introduce long multiplication for multiplying by 2 digits

	10	8
10	100	80
3	30	24



$$\begin{array}{r} \phantom{18} \phantom{0} \phantom{0} \\ \times \phantom{1} \phantom{8} \phantom{0} \\ \hline \phantom{18} \phantom{0} \phantom{0} \phantom{0} \\ \phantom{18} \phantom{0} \phantom{0} \phantom{0} \\ \phantom{18} \phantom{0} \phantom{0} \phantom{0} \\ \phantom{18} \phantom{0} \phantom{0} \phantom{0} \\ \hline 234 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \end{array}$$

$18 \times 3$  on the 1st row

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

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

towards more complex numbers:

$$\begin{array}{r} 1234 \\ \times \quad 16 \\ \hline 7404 \\ 12340 \\ \hline 19744 \end{array}$$

$$\begin{array}{r} 3652 \\ \times \quad 8 \\ \hline 29216 \end{array}$$

Approximate,

Calculate,  
Check it mate!

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

**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  $12 \times 12$ .

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

Reinforcing rapid times table recall:

Demonstration of long multiplication

# Division

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

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

**Short division with remainders:**

Now pupils are introduced to examples that give rise to

remainder answers, division needs to have real life problem solving context. 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.

The answer to  $5309 \div 8$  could be expressed as **663 and five eighths**,  $663r5$  or **rounded** as appropriate to the problem involved.

Include money and measurement contexts.

Introduce long division by 'Chunking' for dividing by 2-digits

36	972
20	972 - 720
5	252 - 180
2	72 - 72

Answer = 27

To find out how many '36's there are in 972 means we need to know our 36 times tables- unless we subtract known 'chunks' until zero is reached (or there is a remainder).

Teachers help pupils write a few useful known chunks e.g. 10x, 5x, 2x & 1x. Limit the number of 'chunk choices' initially.

As children become more confident encourage them to become more efficient with their chunking e.g. if we know 2x, what is 20x etc.

**Key Vocabulary:** share equally, group, equal groups of, lots of, array, dividend, divisor, 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  $12 \times 12$  (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 numbers.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- 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 (e.g.  $98 \div 4 = 24 r2 = 24\frac{2}{4} = 24.5 \approx 25$ ).
- Use multiplication and division as inverses.
- 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.