Year 5 Add numbers with more than 4 digits

including money, measure and decimals with different numbers of decimal places

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

Use column addition to add two or three whole numbers

$$\begin{array}{r} £\,2\,3 \cdot 5\,9 \\ +£\,7 \cdot 5\,5 \\ \hline £\,3\,1 \cdot 1\,4 \\ \hline \end{array}$$

Use column addition to add any pair of two-place decimal numbers including amounts of money.

Say 6 tenths and 7 tenths to reinforce place value

$$\begin{array}{r} 1\,9 \cdot 0\,1 \\ 3 \cdot 6\,5 \\ +0 \cdot 7\,0 \\ \hline 2\,3 \cdot 3\,6 \\ \hline \end{array}$$

Empty decimal places can be filled to with zero to show the place value of each column

Children should:

Understand the place value of tenths and hundredths and use this to align numbers with differing numbers of decimal place.

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

Key Skills for addition at Year 5

- Locate 5 and 6 digit numbers on a landmarked line; use this to compare/order numbers.
- Round to ten, a hundred, a thousand or ten thousand.
- Use rounding to check accuracy
- Understand a one-place decimal number as a number of tenths and a two-place decimal number as a number of hundredths.
- Add or subtract 0.1 or 0.01 to/from any decimal number with confidence, e.g. 5.83 + 0.01 or 4.83 – 0.1
- Add and subtract mentally with confidence – where the numbers are less than 100 or the calculation relies upon simple addition and place value.
- Confidently add numbers with more than 4-digits using a secure written method, including adding 'piles' of numbers
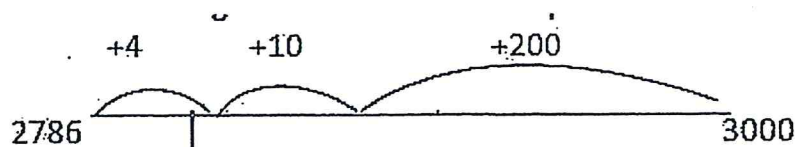- Use inverse to check calculations

Year 5 Subtract with at least 4-digit numbers including money measures and decimals

Use compact column subtraction to subtract numbers with up to 5 digits.

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

Use counting on for subtractions where the larger number is a multiple or near multiple of 1000, or for decimals

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        +4      +10         +200
2786  |                              3000
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Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal point

$$
\begin{array}{r}
{}^{6}\cancel{7}\,{}^{10}\cancel{1}\,6\,{}^{8}\cancel{9}\cdot0 \\
-\quad 3\,7\,2\cdot5 \\
\hline
6\,7\,9\,6\cdot5
\end{array}
$$

> Add a zero in any empty decimal place to aid understanding of what to subtract

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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, take and make, exchange, digit, value, hundreds, inverse, tenths, hundredths, decimal point, decimal

Key Skills for subtraction at Year 5
- Count backwards through zero, using negative numbers
- Add or subtract 0.1 or 0.01 to/from any decimal number with confidence, e.g. 5.83 + 0.01 or 4.83 – 0.1
- Children need to utilise and consider a range of subtraction strategies, jottings and written methods before choosing how to calculate
- Subtract larger numbers using column subtraction or by counting up
- Begin to subtract decimal numbers using counting up: 6.2 – 3.5
- Decide which mental methods to use and explain why

MULTIPLICATION ✗

Year 5 Multiply up to 4 digits by 1 or 2 digits.
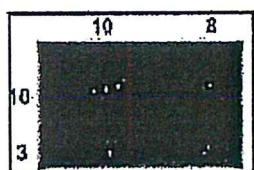
Introducing column multiplication

Introduce column multiplication by comparing a grid method calculation, in order to see how the steps are related. Notice how there are less steps involved.

✗	300	20	7
4	1200	80	28

➡

$$\begin{array}{r} 327 \\ \times \quad 4 \\ \hline 1308 \\ {\scriptstyle 2} \end{array}$$

Introduce long multiplication for multiplying by 2 digits

18 x 3 on the first row

(8 x 3 =24, carrying the 2 for 20, then 1 x 3)

18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first

Move towards more complex numbers

$$\begin{array}{r} 1234 \\ \times \quad 16 \\ \hline 7404 \\ 12340 \\ \hline 19744 \end{array}$$
(1234 x 6)
(1234 x 10)

$$\begin{array}{r} 3652 \\ \times \quad 8 \\ \hline 29216 \\ {\scriptstyle 5 \ 4 \ 1} \end{array}$$

Children should approximate first

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

Key Skills for addition at Year 5
- Know and recite all times tables including division facts.
- Multiply 2- and 3-digit numbers by numbers ≤12 using grid method; multiply 2-digit by 2-digit numbers using grid method.
- Identify multiples and factors, using knowledge of multiplication tables up to 12 x 12
- Scale up or down by a factor of 2, 5 or 10
- Multiply integers and decimals by 10, 100, 1000
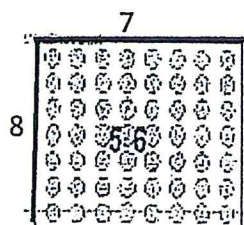- Recognise and use squared, cubes and their notations

Year 4 Divide up to 3-digit numbers by a single digit.

Short division: Limit numbers to NO remainders in the answer
OR carried (each digit must be a multiple of the divisor).

Remind children of correct place value, that 96 is
equal to 90 and 6. Use Dienes to demonstrate.

$$3)\overline{96} = 32$$

Once children are secure with division as grouping, demonstrate this using number lines, arrays etc., short division for larger 2-digit numbers should be introduced, initially with carefully selected examples requiring no calculating of remainders at all. Start by introducing ▮ the layout of short division by comparing it to an ar-

Example without remainder:
81 ÷ 3

81 is partitioned into multiples of 3 which are then each divided by 3	Over time, this is refined so that the dividend is partitioned into the highest multiple of the divisor that is also a multiple of 10, plus any remaining ones
10 + 10 + 7 3 ⟌ 30 + 30 + 21	20 + 7 3 ⟌ 60 + 21

$$3 \mid 8^21 = 27$$

Model this expanded division using Numicon

Move to short division with remainders,

modeling process as expanded division first as seen above.

Example with remainder

$$6 \mid 2\,8^44 = 47\,r2$$

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

Key Skills for division at Year 4

- Use a written method to divide a 2-digit or a 3-digit number by a single-digit number.
- Give remainders as whole numbers.
- Recall multiplication and division facts for all numbers up to 12 x 12.
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying and dividing by 10 and 100 and 1.
- Pupils practise to become fluent in the formal written method of short division with exact answers when dividing by a one-digit number
- Pupils practise mental methods and extend this to three-digit numbers to derive facts, for example 200 × 3 = 600 so 600 ÷ 3 = 200
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as three cakes shared equally between 10 children.