

Calculation Methods



WEST RISE

Year 5

About Our Calculation Policy

The following calculation policy has been written to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school.

Year Group expectations:

The calculation policy is organized according to Year group expectations, as set out in the National Curriculum 2014, however it is vital that pupils are taught according to the stage that they are currently working at, being moved on to the next level as soon as they are ready or working at a lower stage until they are secure enough to move on.

Providing a context for calculation:

It is important that any type of calculation is given a real-life context or problem solving approach to help build children's understanding of the purpose of calculation, and to help them recognize when to use certain operations and methods when faced with problems. This will be a priority within calculation lessons.

Choosing a calculation method:

Children will be taught and encouraged to use the following processes in deciding which approach they will take to a calculation to ensure they select the most appropriate method for the numbers involved.

Key Skills for Year 5

- Locate 5- and 6-digit numbers on a landmarked line; use this to compare and order numbers
- Round to ten, a hundred, a thousand or ten thousand
- Begin to read scales of different types
- Understand a 1-place decimal number as a number of tenths and a 2-place decimal number as a number of hundredths
- Understand effect of \times and \div by 10 and 100 to give 1- and 2-place decimal answers
- Add or subtract 0.1 or 0.01 to or from any decimal number with confidence
- Confidently add and subtract mentally where numbers are <100 or the calculation relies upon simple + or - and place value
- Confidently add 3- and friendly 4-digit numbers together using a secure written method, including adding 'piles' of numbers
- Subtract larger numbers using expanded column subtraction or by counting up
- Begin to subtract decimal numbers using counting up: $6.2 - 3.5$
- Know, recite all times tables including division facts
- Using grid method, multiply 2- and 3-digit numbers by numbers <12 and multiply 2-digit by 2-digit numbers
- Scale up or down by a factor of 2, 5 or 10
- Perform divisions mentally within range of tables facts using remainders and fractions and decimal equivalences
- Divide 2-digit and 3-digit numbers by one-digit numbers above the range of tables using a written method
- Reduce fractions to simplest form, including tenths to fifths and hundredths to tenths
- Identify simple fraction and decimal equivalents
- Measure and compare capacities, weights and lengths, including perimeters using SI units; understand the concept of area and count squares to find areas
- Understand properties of triangles; find unknown angles in triangles and rectangles

Key Vocabulary for Year 5

Addition

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

Subtraction

take, take away, less, minus, subtract, leaves, distance between, how many more, how many less/fewer, how many left, how much less it ___? difference, count on, partition, tens, units, ones, least, count back, count on, exchange, decrease, hundreds, value, digit, inverse, decimal places, decimal point, tenths, hundredths, thousandths

Multiplication

groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times, ___ times, once/twice/three times, partition, grid method, multiple, product, tens, unit, value, inverse, square, factor, integer, decimal, short/long multiplication,

Division

share, share equally, one each, two each, group, equal groups of, lots of, arrays, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, carry, remainder, multiple, divisible by, factor, inverse, quotient, prime numbers, prime factors, composite

Addition

$$\begin{array}{r} \text{H T U} \\ 4 5 6 \\ + 3 6 7 \end{array}$$

- Line the numbers up in the correct columns
- Add the **units** together (carry any **tens** forward to the **tens** column)
- Add the **tens** together (carry any **hundreds** forward to the **hundreds** column)
- Add the **hundreds** together

Standard Method

$$\begin{array}{r} \text{HTU} \\ 456 \\ + 367 \\ \hline 823 \\ \hline 11 \end{array}$$

$$456 + 367 = 823$$

Multiplication

$$\begin{array}{r} \text{H T U} \\ 136 \end{array} \times \begin{array}{r} \text{H T U} \\ 7 \end{array}$$

- Multiply the **units** by the **multiplier** (carry any **tens** forward to the **tens** column)
- Multiply the **tens** by the **multiplier** (carry any **hundreds** forward to the **hundreds** column)
- Multiply the **hundreds** by the **multiplier**

Standard Method

$$\begin{array}{r} \text{HTU} \\ 136 \\ \times \quad 7 \\ \hline 952 \\ 24 \\ \hline \end{array}$$

$$136 \times 7 = 952$$

Multiplication

$$\begin{array}{r} \text{T U} \times \text{T U} \\ 43 \times 32 \end{array}$$

- Line the numbers up in the correct columns
- Multiply the **units** by the **unit multiplier** (carry any **tens** forward to the **tens** column)
- Multiply the **tens** by the **unit multiplier** (carry any **hundreds**)
- **Add a place holder**
- Multiply the **units** by the **tens multiplier** (carry any **tens** forward to the **tens** column)
- Multiply the **tens** by the **tens multiplier** (carry any **hundreds**)
- Add the two calculation results together

Standard Method

$$\begin{array}{r} \text{T U} \\ 43 \\ \times \quad 32 \\ \hline 86 \\ + 1290 \\ \hline 1376 \\ \hline \end{array}$$

$$43 \times 32 = 1,376$$

Division

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \quad \quad \text{U} \\ 6 \quad 2 \quad 3 \quad \div \quad 5 \end{array}$$

- Draw out the bus stop
- Place in the numbers
- Divide the **hundreds** by the number you are dividing by. (Exchange remaining **tens**)
- Divide the **tens** by the number you are dividing by. (Exchange remaining **units**)
- Divide the units by the number you are dividing by

Short Method

$$\begin{array}{r} 1 \\ 5 \overline{) 6123} \end{array}$$

How many 5s in 600? 100
(This leaves 100 which is exchanged for ten **tens** in the **tens** column)

$$\begin{array}{r} 1 \quad 2 \\ 5 \overline{) 61223} \end{array}$$

120 divided by 5 = 20
(This leaves 20 which is exchanged for 20 **units** in the **units** column)

$$\begin{array}{r} 1 \quad 2 \quad 4 \quad r3 \\ 5 \overline{) 61223} \end{array}$$

20 divided by 5 = 4

$$623 \div 5 = 124 \text{ r}3$$

Division

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \quad \quad \text{U} \\ 9 \quad 7 \quad 6 \quad \div \quad 15 \end{array}$$

- Draw out the bus stop
- Place in the numbers
- Divide the **hundreds** by the number you are dividing by. (Exchange remaining **tens**)
- Divide the **tens** by the number you are dividing by. (Exchange remaining **units**)
- Divide the units by the number you are dividing by

Short Method

$$\begin{array}{r} 0 \\ 15 \overline{) 9 \quad 9 \quad 7 \quad 6} \end{array}$$

How many 15s in 9? 0
(Carry the **hundreds** to the **tens** column)

$$\begin{array}{r} 0 \quad 6 \\ 15 \overline{) 9 \quad 9 \quad 7 \quad 7 \quad 6} \end{array}$$

97 divided by 15 = 6
(This leaves 7 which is carried to the **units** column)

$$\begin{array}{r} 0 \quad 6 \quad 5 \quad r1 \\ 15 \overline{) 9 \quad 9 \quad 7 \quad 7 \quad 6} \end{array}$$

76 divided by 15 = 5 with a remainder of 1

$$976 \div 15 = 65 \text{ r}1$$