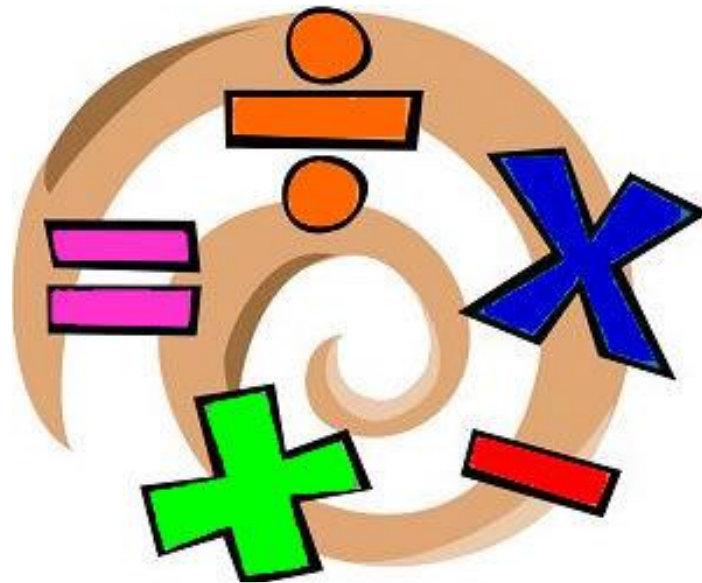




Guide to Written Calculation Strategies for Year 3 Children and Parents

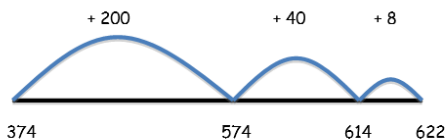


Addition (+)

Add numbers up to 3 digits using a number line

$$374 + 248 = 622$$

200 40 8



- Write the first number on the number line
- Add the hundreds
- Add the tens
- Add the ones
- Your answer is the number you land on after adding each partitioned part of the number.

Add numbers using the 'W' Method (up to 3 digits)

T	O		T	O					
2	7	+	3	4	=	6	1		

$$50 + 11 = 61$$

H	T	O		H	T	O							
3	6	5	+	1	2	6	=	4	9	1			

$$400 + 80 + 11 = 491$$

- Add the ones by joining the lines from the O digits. Say five ones add six ones equals eleven ones
- Add the tens by joining the lines from the T digits. Say sixty add twenty equals eighty (it is also useful for children to understand 6 tens add 2 tens equals 8 tens).
- Add the hundreds by joining the lines from the H digits, Say three-hundred add one-hundred equals four-hundred.
- Add the partitioned parts together.
- Write the final answer.

Add numbers up to 3 digits using the expanded method of column addition

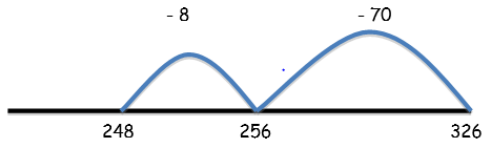
$$\begin{array}{r}
 146 \\
 + 273 \\
 \hline
 9 \text{ (} 6 + 3 \text{)} \\
 + 110 \text{ (} 40 + 70 \text{)} \\
 \hline
 300 \text{ (} 100 + 200 \text{)} \\
 \hline
 419
 \end{array}$$

- Write the first number down, with the second number beneath it. Ensure the place value columns line up accurately.
- Use brackets to partition each number, recording each addition at the side
- Add the ones, tens and hundreds
- Total up the values and write it underneath the calculations

Subtraction (-)

Subtract numbers with up to 3 digits using a number line

$$326 - 78 = 248$$



- Write the first (larger) number on the right of the number line
- Partition the smaller number into hundreds, tens and ones (where applicable)
- Subtract the hundreds (if applicable)
- Subtract the tens
- Subtract the ones

You might need to add an extra step: in the above example you could subtract 20 and then 50 to easier bridge the 300.

Expanded Method for up to 3 digit numbers

$$651 - 324 = 327$$

$$\begin{array}{r} 600 \quad 40 \quad 1 \\ - 300 \quad 20 \quad 4 \\ \hline 300 + 20 + 7 = 327 \end{array}$$

- Partition each number into hundreds, tens and ones
- Write the first number down, with the second number beneath it. - ----
- Remember to line up the place value columns accurately.
- Subtract the ones from the ones column
- **If there is a red alert:** exchange from the next column
- Subtract the tens from the tens and the hundreds from the hundreds.
- Write the answers underneath each column.
- Add together (recombine) the values.

Multiplication (x)

Multiplication using the compact grid method for TU x O (start with teens numbers):

$$13 \times 4 = 52$$

X	10	3
4	40	12

$$40 + 12 = 52$$

$$43 \times 8 =$$

X	40	3
8	320	24

$$320 + 24 = 344$$

- Partition the 2-digit number into tens and ones
- Lay the digits out in the grid, with the partitioned number in the tens and ones columns along the top
- Multiply the tens by the number you are multiplying by
- Multiply the ones by the number you are multiplying by
- Add these values up to find your answer (you may want to use an addition written method to help you).

Expanded Method of short multiplication for 2 digit numbers

23

x4

12 (3 x 4) Multiply the units

80 (20 x 4) Multiply the tens saying twenty times 4

92 Total the columns

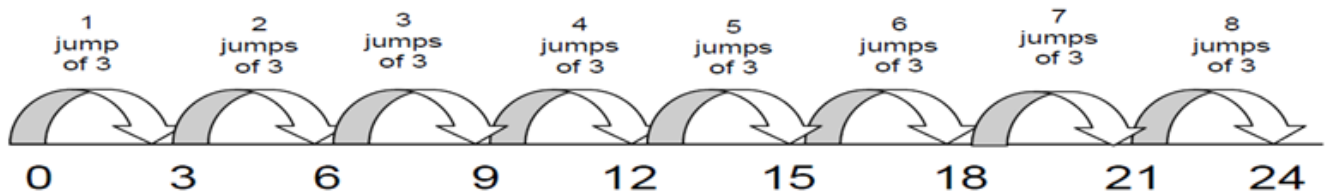
- Write the number you are multiplying down, with number you are multiplying by underneath.
- Partition the number you are multiplying and multiply each part by the number you are multiplying by, recording this in brackets next to the method.
- Line up the digits accurately
- Multiply the ones digit
- Multiply the tens
- Add up the values to reach your answer.

Division (\div)

Using an empty numberline to count forward in multiples of 2, 5, 3, 4, 8 and 10 to create equal groups

$$24 \div 3 = 8$$

How many 3s in 24? Or how many groups of 3 in 24?



- Put 0 at the left hand side of the numberline
- Count on in multiples of the number you are dividing by recording each jump
- When you reach the number you are 'grouping' (in this example 24), count how many jumps you took to reach your answer
- This is how many multiples of the number fit into the starting number

Division by drawing dienes in a bar model

$$52 \div 4 = 13$$

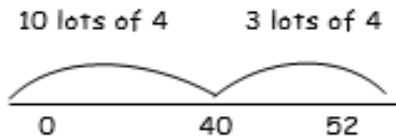
$$40 \div 4 = 10$$

$$12 \div 4 = 3$$

52			
I	I	I	I
X	X	X	X
X	X	X	X
X	X	X	X

- Draw a bar model with the number you are dividing at the top. Don't draw a line across the bottom as you will be writing downwards.
- Split the bottom section of the bar model into the number you are dividing by.
- Using a line to show a 'ten stick', share out tens until you can not share out equally any more (write the number sentence if the method is understood).
- Count on in ones, using a cross for each one. Share out the ones until you reach the number you are dividing by (write the number sentence if the method is understood).
- Count up the number in each section to find the answer.

Division by chunking using a number line



Count up the lots of 4: $10 + 3$

$$52 \div 4 = 13$$

- Draw a number line with 0 at one end and the number you are dividing at the other end
- Count up from 0 in chunks of the number you are dividing by
- It is useful to use "chunks" that are multiples of 10 where possible
- Work out how much is left
- Use times tables knowledge to work out how

many lots of the dividing number this is equal to.

- Count up how many lots of the number you have jumped

Division using partitioning and chunking

$$65 \div 5 = 13$$

$$65 = 50 + 15$$

$$50 \div 5 = 10$$

$$15 \div 5 = 3$$

$$10 + 3 = 13$$

- Partition the number you are dividing into multiples of the number you are dividing by (useful to chunk in multiples of 10)
- Work out how many lots of the number you are dividing by fit into each partitioned value
- Add these values to reach your answer