

ST. TERESA'S SCHOOL



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Calculation Policy

Year Three

Addition - Year Three

Key Skills

- Count from 0 in multiples of 2, 3, 4, 5, 8, 10, 50 and 100. Find 10 and 100 more than any given number.
- Compare and order numbers up to 100.
- Read and write numbers to 1000 in numerals and words.
- Add 2 digit number mentally including those that bridge 100.
- Add a 3 digit number and ones, a 3 digit number and 10s and a 3 digit number and 100s mentally.
- Estimate answers to calculations, using the inverse operation to check.
- Solve problems, including missing number problems using number facts and place value.
- Recognise the place value of each digit in a 3 digit number (hundreds, tens and units).
- Continue to practice many different mental addition strategies including adding to the nearest multiple of 10, 100, 1000 and adjusting, using number bonds, using near doubles, partitioning and recombining etc.
- Continue to use a number line to consolidate mental strategies.

Focus: Adding with numbers up to 3 digits.

In Year 3 we will move to the traditional column method and to support this, children will first apply their partitioning skills to the partitioning column method.

$$246 + 132 = 378$$

$$200 + 40 + 6$$

$$100 + 30 + 2$$

$$\underline{300 + 70 + 8} = 378$$

Introduce the partitioning column method with numbers that do not bridge so children become confident with the method itself.

$$337 + 188 = 525$$

$$300 + 30 + 7$$

$$100 + 80 + 8$$

$$\underline{400 + 110 + 15} = 525$$

Once confident, children can start using the partitioning column method to solve problems that bridge the tens and hundreds boundaries.

Add units first!

$$116 + 343 = 459$$

$$\begin{array}{r} 343 \\ + 116 \\ \hline 459 \end{array}$$

Now children are ready to move on to the traditional column methods. Introduce this initially with numbers that do not bridge any boundaries. It is important children remember that it is three hundred add one hundred, NOT 3 + 1!

$$245 + 84 = 329$$

$$\begin{array}{r} 245 \\ + 84 \\ \hline 329 \\ 1 \end{array}$$

Once the method is secure children are now ready to be introduced to 'carrying' which happens when bridging in the column method. Make sure children add the units first and 'carry' numbers under the bottom line.

Key Vocabulary

Add, more, plus, and, make, altogether, total, equal to, equals, the same as, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, *hundreds boundary*, *increase*, *vertical*, *carry*, *expanded*, *compact*.

Subtraction - Year Three

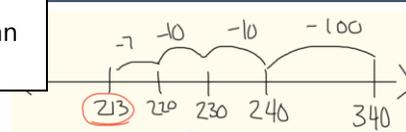
Key Skills

- Subtract mentally: a 3 digit number and 1s, a 3 digit number and 10s and a 3 digit number and 100s.
- Estimate answers and use the inverse to check.
- Solve problems in different contexts, including missing number problems, using number facts, place value, and more complex subtraction.
- Find 10 or 100 more or less than a given number.
- Recognise the place value in a 3 digit number, 100s, 10s and 1s.
- Solving finding the difference problems using counting on.
- Reading and writing numbers up to 1000 in numerals and words.
- Practise and develop mental strategies including subtracting near multiples of 10 and adjusting, counting on etc.
- Subtract numbers with up to three digits, using formal written methods of columnar subtraction.

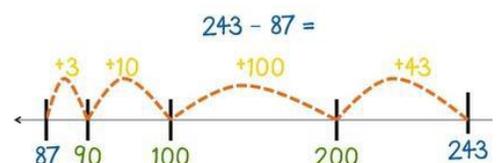
Focus: Subtracting with 2 and 3 digit numbers.

In Year 3 children will consolidate their knowledge of counting back and counting on using a blank number line to subtract. They will use these methods both written and mentally. Once children become fully confident they will be ready to move on to the partitioning column method of subtraction.

Children will continue to subtract on a number line using efficient jumps and now apply these to 3 digit number problems. Here is an efficient example of $340 - 127 =$



Counting on will also be used for problems greater than 100 using efficient jumps, the use of 100 square can support children's understanding of this method.



$$\begin{array}{r} 80 + 9 \\ - 30 + 5 \\ \hline 50 + 4 \end{array}$$

Children will now have the mental skills required to approach the partitioning column method of subtraction. At first they should attempt this where no exchanging is required. Here is an example for $89 - 35 = 54$



$$\begin{array}{r} 70 + 2 \\ - 40 + 7 \\ \hline 20 + 5 = 25 \end{array}$$

Through practical subtraction children should be introduced to exchanging. It is important children realise that the value has not changed, we have just partitioned in a different way. As you can see here for $72 - 47$, before subtracting 7 units, a tens row will need to be exchanged for 10 units.

Children who are secure with the concept of 'exchanging' should now be able to use the partitioning column method to subtract any 2 numbers.

$$\begin{array}{r} 238 - 146 = 92 \\ \begin{array}{r} 100 \\ 200 + 30 + 8 \\ - 100 + 40 + 6 \\ \hline 0 + 90 + 2 \end{array} \end{array}$$

Key Vocabulary

Equal to, take, take away, less, minus, subtract, leaves, distance between, difference between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is_?, count on, strategy, partition, tens, units, sum, difference, *exchange*, *decrease*, *hundreds*, *value*, *digit*

Multiplication - Year Three

Key Skills

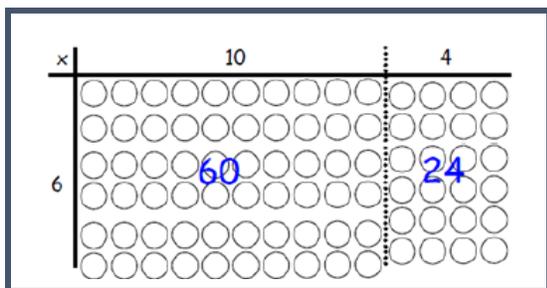
- Recall and use multiplication facts for the 2, 3, 4, 5, 6, 8 and 10 multiplication tables and multiply multiples of 10.
- Write and calculate number sentences using known \times tables.
- Answer 2 digit \times 1 digit problems using mental and formal written methods.
- Solve multiplication problems in context including missing number problems.
- Develop mental strategies using commutativity (e.g. $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and for missing number problems.

Focus: Multiplying 2 digit numbers by 1 digit numbers

In Year 3 children will move on from arrays and start using the grid method of multiplication. It is essential that before children move onto the grid method they are completely confident with all previous methods and have a solid grounding with mental methods and partitioning.

Before moving on to grid multiplication, children need to be able to ...

- Partition numbers into tens and units
 - Multiply single digits by multiples of 10 ($3 \times 30 = 90$).
 - Quickly recall multiplication facts for the 2,3,4,5,6 and 10 \times tables.
- Use any previous method to work out unknown multiplication facts, quickly and accurately.



The grid method should be introduced using an arrays model such as the one to the left for 14×6 . Children need to use their partitioning skills to partition the two digit number and then use their existing knowledge of arrays to come to an answer with minimal support.

Multiplication grid method requires good organization but also a solid understanding of partitioning and multiplication facts, as you can see in the example to the right for 35×7 . The children need to remember that once they have multiplied the partitioned parts of the number, they then need to add the two together.

\times	30	5
7	210	35

$$210 + 35 = 245$$

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*, *multiple*, *product*, *tens*, *units*, *value*

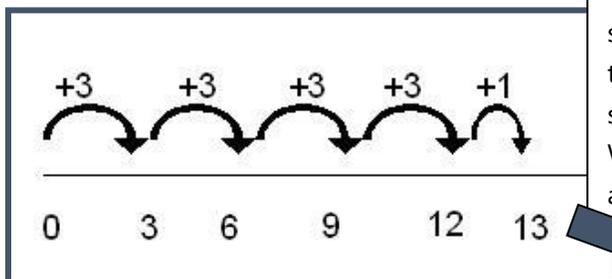
Division - Year Three

Key Skills

- Recall and use and \div facts for the 2, 3, 4, 5, 6, 8 and 10 x tables (using doubling to connect the 2,4 and 8 x tables)
- Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, using mental and progressing to formal written methods
- Solve problems in a variety of contexts including missing number problems.
- Pupils begin to derive related facts e.g. $9 \div 3 = 3$ means $90 \div 3 = 30$ or $90 \div 30 = 3$.
- Pupils develop confidence in written methods, moving from number lines to short division.

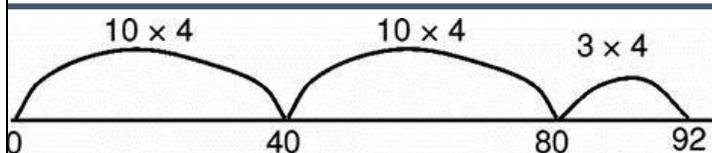
Focus: Dividing 2 digit numbers by 1 digit numbers moving from number line methods to short division

Children in Year 3 will continue to use a number line to solve division problems and will begin to jump more than one step at a time in the style of 'chunking'. Once confident they will move on to short division without any remainders.



Children will begin to use the grouping number line method to solve problems with remainders. They will start on zero and write the dividend at the end of their number line. They will jump in steps of the divisor until they get as close to the end as possible. Whatever is left over is the remainder. Using cubes or arrays alongside the number line will consolidate understanding.

Once confident children will begin to solve problems on a grouping number line involving bigger numbers. To solve this effectively they will need to subtract chunks of the divisor. As you can see in the image for $92 \div 4$, a step of 10 groups of 4 has been jumped, followed by another step of 10 jumps, finally followed by a step of 3 jumps of 4. This means that in total 4 was jumped 23 times making 23 the answer.



Initially children will start with simple problems where each digit is a multiple of the divisor.

A short division diagram for $96 \div 3$. The divisor 3 is written on the left. The dividend 96 is written inside a grid. The quotient 32 is written above the grid. A horizontal line separates the divisor from the dividend.

Once children are confident with number line methods then they should start work on short division. First of all arrays should be used to show a division calculation, the same calculation should then be shown in the short multiplication method. Place value should be regularly discussed so children realize that they are partitioning the dividend and dividing the units then tens by the divisor.

Key Vocabulary

Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, *inverse*, *short division*, *carry*, *remainder*, *multiple*

Year Three Statutory Requirements

<p style="text-align: center;">Number - Place Value</p>	<p style="text-align: center;">Number – Fractions</p>
<ul style="list-style-type: none"> • count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number □ • Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • Compare and order numbers up to 1000 • Identify, represent and estimate numbers using different representations. • Read and write numbers up to 1000 in numerals and in words. • Solve number problems and practical problems involving these ideas. 	<ul style="list-style-type: none"> • Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators □ recognise and show, using diagrams, equivalent fractions with small denominators. • Add and subtract fractions with the same denominator within one whole [for example, $75 + 71 = 76$] • Compare and order unit fractions, and fractions with the same denominators. • Solve problems that involve all of the above.
<p style="text-align: center;">Number – Addition & Subtraction</p>	<p style="text-align: center;">Number – Multiplication & Division</p>
<ul style="list-style-type: none"> • Add and subtract numbers mentally, including: <ul style="list-style-type: none"> • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds • Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. • Estimate the answer to a calculation and use inverse operations to check answers. • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. 	<ul style="list-style-type: none"> • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Geometry – Property of Shape	Geometry – Position & Direction
<ul style="list-style-type: none"> • Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. • Recognise angles as a property of shape or a description of a turn. • Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. <p style="text-align: center;">Measures</p> <ul style="list-style-type: none"> • Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • Measure the perimeter of simple 2-D shapes • Add and subtract amounts of money to give change, using both £ and p in practical contexts. • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • Know the number of seconds in a minute and the number of days in each month, year and leap year. • Compare durations of events [for example to calculate the time taken by particular events or tasks]. 	<p style="text-align: center;">Statistics</p> <ul style="list-style-type: none"> • Interpret and present data using bar charts, pictograms and tables. • Solve one-step and two-step questions, for example: 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables.

