



Funded by
Department
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English Hubs
St John Vianney English Hub

St John Vianney Catholic Primary School

Seeking Growth Together through Jesus

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Year 5 and 6

Parents' Calculation Workshop

Aims and objectives

- To share with parents the school's calculation policy
- To share with parents the strategies and method employed at school so that they are mirrored at home.
- To give parents the knowledge and skill to develop their children's understanding of calculation methods.
- To highlight to parents other areas that would lead to a mastery of calculation related to the phase their child/children are in

Addition

Year 4

Column method- regrouping with up to 4 digits and carrying

Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.

Estimate and use inverse operations to check answers to a calculation.

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

As year 3 but with up to 4 digit numbers and with carrying.

Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.



Chd will be able to add any digit number with more than one carry if needed.

Th	H	T	O
2	3	1	4
+3	8	8	6
6	2	0	0
1	1	1	

Year 5 and 6

Column method with regrouping. Dealing with larger numbers and decimals numbers.

Children should also be able to solve inverse problems related to the column method.

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).

Add and subtract numbers mentally with increasingly large numbers.

Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.

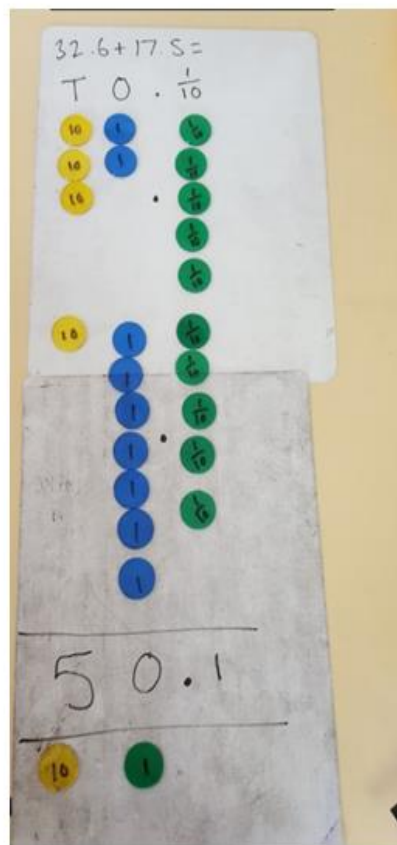
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Use their knowledge of the order of operations to carry out calculations involving the four operations.

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Solve problems involving addition, subtraction, multiplication and division.

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

As children move on to decimals, money and decimal place value counters can be used to support learning.



As Year 4 if required based on decimal values.

As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.

$$\begin{array}{r} 72.8 \\ + 54.6 \\ \hline 127.4 \\ 11 \end{array}$$

$$\begin{array}{r} \pounds 23.59 \\ + \pounds 7.55 \\ \hline \pounds 31.14 \\ 111 \end{array}$$

$$\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \\ 212 \end{array}$$

Language

- add, addition, more, plus, increase
- sum, total, altogether
- score
- how many more to make...?
- one more, two more... ten more
- how many more to make...?
- how many more is... than...?
- how much more is...?

Steps to proficiency

- Addressing misconceptions.
 - Does the answer make sense? If I am adding, will the total be bigger or smaller?
 - Mistakes in setting out – Not lining up numbers. Decimals.
 - Mistakes in carrying – Carrying the wrong number.
 - Mixing methods.
 - Forgetting to put in place holder zero.
- Quick recall is vital. Counting one by one is not the most efficient method
- Number bonds to 10 and 20.

Subtraction

Year 4 Column method with regrouping

Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.

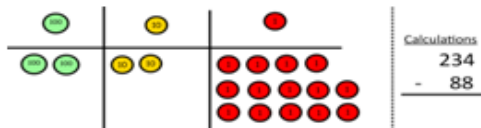
Estimate and use inverse operations to check answers to a calculation.

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the place value counters.



Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.



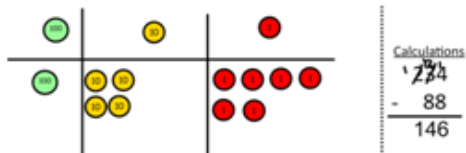
Now I can subtract my ones. Now look at the tens, can I take away 8 tens easily?



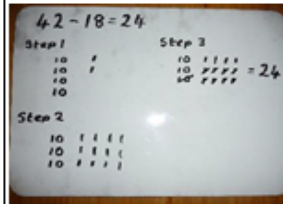
I need to exchange one hundred for ten tens.



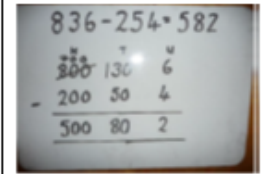
Now I can take away eight tens and complete my subtraction



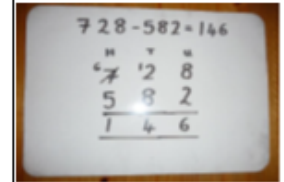
Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.



Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.



Children can start their formal written method by partitioning the number into clear place value columns.



When confident, children can find their own way to record the exchange/regrouping.

Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.

Year 5 and 6

Column method

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).

Add and subtract numbers mentally with increasingly large numbers.

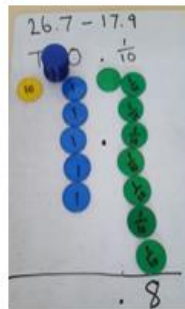
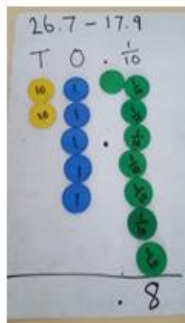
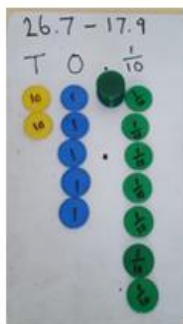
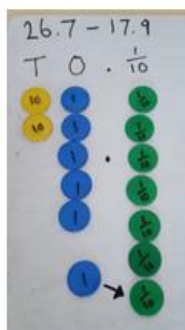
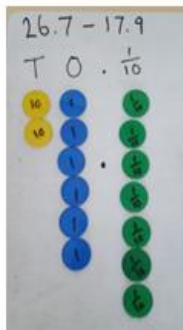
Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Use their knowledge of the order of operations to carry out calculations involving the four operations.

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Solve problems involving addition, subtraction, multiplication and division.

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.



Use concrete materials to represent columnar subtraction with decimal numbers. Decimal numbers can also be represented with base equipment.

As year 4 if needed with decimal numbers.

Move chd onto using the column method to subtract increasingly larger numbers. Including those where more than one borrow is required.

$$\begin{array}{r} \overset{3}{\cancel{4}} \overset{9}{\cancel{0}} \overset{1}{3} \\ - \quad 2 \quad 8 \quad 4 \\ \hline 1 \quad 1 \quad 9 \end{array}$$

Then, develop an understanding of subtracting any number including decimals.

$$\begin{array}{r} \overset{5}{2} \overset{12}{\cancel{6}} \overset{1}{\cancel{3}} . \overset{1}{0} \\ - \quad 2 \quad 6 \quad . \quad 5 \\ \hline 2 \quad 3 \quad 6 \quad . \quad 5 \end{array}$$

Language

- subtract, subtraction, take (away), minus, decrease
- leave, how many are left/left over?
- difference between
- half, halve
- how many more/fewer is... than...?
- how much more/less is...?
- equals, sign, is the same as
- tens boundary, hundreds boundary

Steps to proficiency

- Addressing misconceptions.
 - Does the answer make sense? If I am subtracting, will the total be bigger or smaller?
 - Mistakes in borrowing
 - Not lining numbers up correctly
 - Forgetting place holder zeros when needed
 - Mixing up with addition method
 - Putting smaller number on the top
 - Forgetting to move the borrow over or changing the digit borrowed from
- Understanding difference – to find the difference we subtract.

Multiplication

Year 4
Column multiplication
 Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

Recall multiplication and division facts for multiplication tables up to 12×12 .

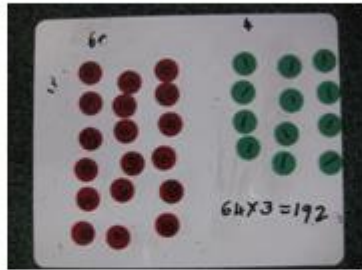
Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.

Recognise and use factor pairs and commutativity in mental calculations.

Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

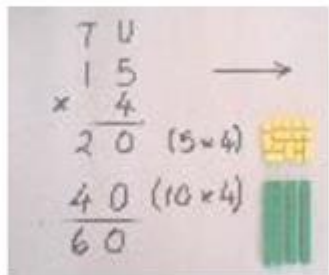
Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Children can continue to be supported by place value counters at the stage of multiplication.

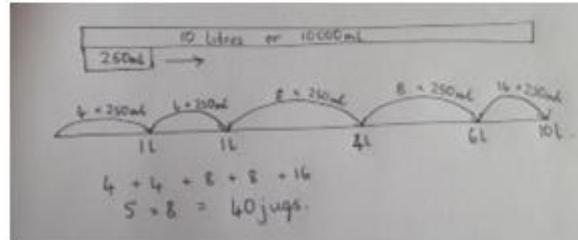
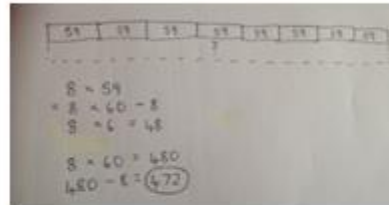


It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Use concrete apparatus to develop understanding of multiplication of 2 digits by 1 digit using the expanded method



Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.



$$\begin{array}{r} \text{T} \quad \text{U} \\ 1 \quad 5 \\ \times \quad 4 \\ \hline 2 \quad 0 \quad (5 \times 4) \\ 4 \quad 0 \quad (10 \times 4) \\ \hline 6 \quad 0 \end{array}$$

Moving onto 3 digits by 1 digit

$$\begin{array}{r} 4 \quad 1 \quad 3 \times 5 \\ 3 \times 5 = 15 \\ 10 \times 5 = 50 \\ 400 \times 5 = + 2000 \\ \hline = 2065 \end{array}$$

Language

- lots of, groups of
- times, multiply, multiplication, multiplied by
- multiple of, product
- once, twice, three times... ten times...
- times as (big, long, wide... and so on)
- repeated addition
- array

Steps to proficiency

- Common misconceptions:
 - Forgetting place holder zero
 - Forgetting to carry – making the carry too big leading them to add the carry when recombining answers
 - Understanding commutative law –
 - $2 \times 3 = 6$ is the same as $3 \times 2 = 6$
- Learning by rote
- Multiplication songs
- Missing number –
 - $2 \times ? = 6$
- Home school learning schemes
- Understanding of inverse

Division

Year 5

Short division

Pupils start with dividing 4-digit numbers by 2, 3 and 4, where no regrouping is required. Place value counters are used simultaneously in a place value chart, to develop conceptual understanding. They progress to calculations that require regrouping in the hundreds or tens columns. Pupils build on their conceptual knowledge of division to become confident with dividing numbers where the tens digit is smaller than the divisor, extending this to any digit being smaller than the divisor.

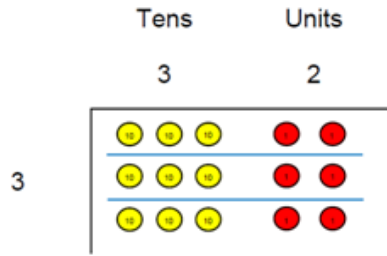
Multiply and divide numbers mentally drawing upon known facts.

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.

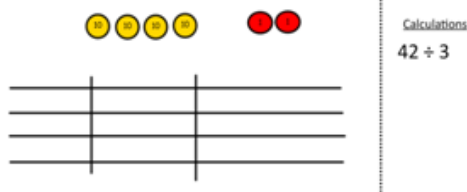
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.

Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.

Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.



Use place value counters to divide using the bus stop method alongside

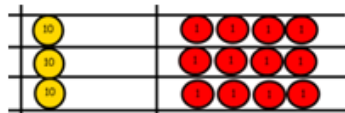


$$42 \div 3 =$$

Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

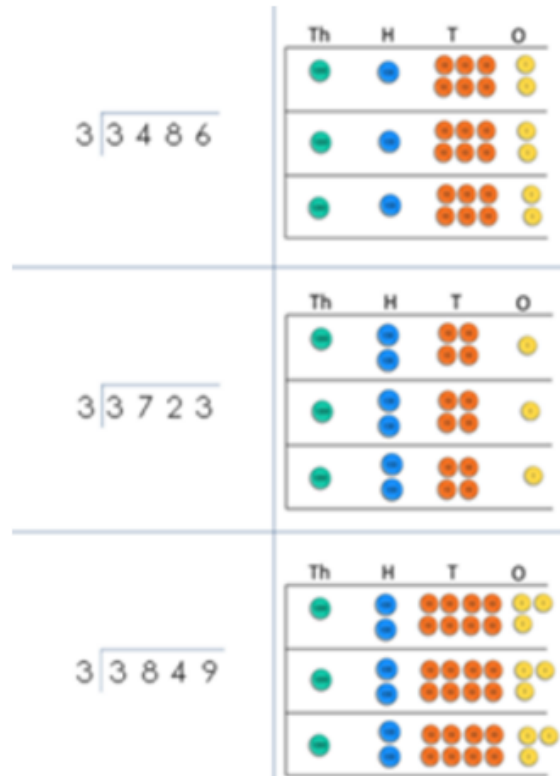


We exchange this ten for ten ones and then share the ones equally among the groups.



We look how much in 1 group so the answer is 14.

Students move onto representing concept learn using concrete apparatus to drawing to represent different values:



Moving onto short division; begin with divisions that divide equally with no remainder.

$$\begin{array}{r} 218 \\ 3 \overline{)872} \end{array}$$

Move onto divisions with a remainder.

$$\begin{array}{r} 86 \text{ r } 2 \\ 3 \overline{)432} \end{array}$$

Year 6

Short division

Children to be able to divide so that there are no remainders, going into the decimal values if needed.

Use written division methods in cases where the answer has up to two decimal places.

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.

Pupils should be encouraged to note down multiples when dividing by a 2 digit number

$$\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \\ \underline{35} \\ 161 \\ \underline{140} \\ 210 \\ \underline{210} \\ 0 \end{array}$$

35
70
105
140
...

Language

- share, share equally
- one each, two each, three each...
- group in pairs, threes... tens
- equal groups of
- divide, division, divided by, divided into
- remainder

Steps to proficiency

- Common misconceptions
 - Forgetting the zero when the dividend does not go into the divisor
 - Forgetting to carry remainders
 - Forgetting to write down final remainder
- Knowledge of times table and corresponding division facts to aid efficiency
- Interpreting of remainder
- Understanding that groups must have equal amounts

- Understanding inverse to master concepts
- Parental input is vital