

Parent's Guide to Supporting Maths in the National Curriculum – Year 5/6

In the National Curriculum, children will need to develop a very sound understanding of their maths to be able to meet the learning objectives. These need to be taught in an “age appropriate” manner which allow the children to use a series of representations and resources that will be suitable for a developing 9-11 year old brain.

Below you will find an overview of the types of calculating your child will be expected to do in year 5 and 6. We have included the types of representations we use with them. In line with the National Curriculum Aims, we use these to develop **an understanding** of the concept to build a really firm foundation in calculations and therefore **do not** teach the children a procedure to follow to “do a sum” as this has been shown to have no long term benefit. Some children will prefer some representations more than others and may not use all of them. They all will progress at different rates, but all should be securely using more compact methods by year 5. Year 5/6 focusses more on the application of number skills with ever increasing complexity. This means the children need to use their reasoning skills and will do best if they are fluent in their number/table facts and methods. Practical handling of resources still remains essential to aid secure understanding ready for this more demanding curriculum.

Place Value

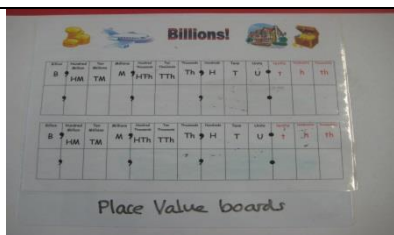
Year 5

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- solve number problems and practical problems that involve all of the above
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals

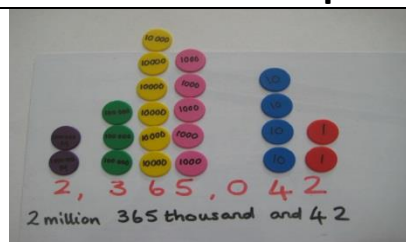
Year 6

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number problems and practical problems that involve all of the above

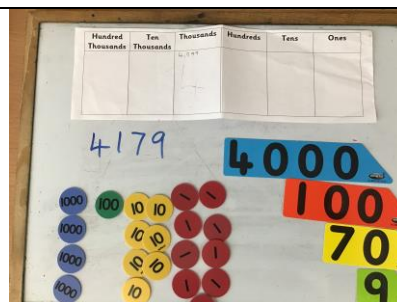
Representations we use for Place Value



Place Value boards help us learn about numbers into the millions and beyond. Lots of practice is needed to be secure in writing and reading large numbers.



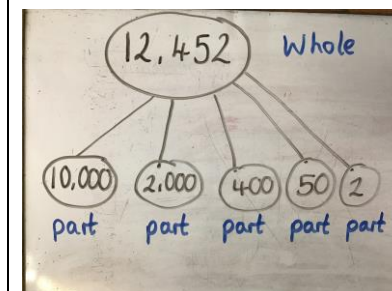
Following on from the work started in Year 4, Place Value counters consolidate working with much larger numbers and the children understand each colour has a different place value. Knowing 0 is a place holder is also very important.



Arrow cards and place value counters help us learn to read and write large numbers.

1000	2000	3000	4000	5000	6000	7000	8000	9000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009

Place Value Charts appeal to other children to see how the numbers are built up or partitioned out.



The part whole model helps us to split a number up into each part. This number can be split in different ways e.g. $12,452 = 12,000 + 450 + 2$.

Addition and Subtraction

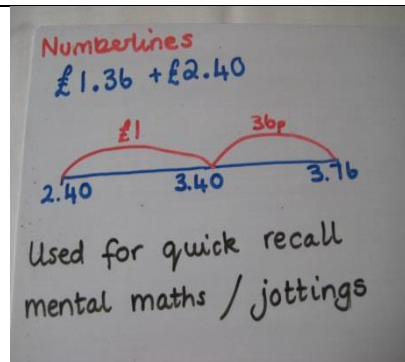
Year 5

- 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

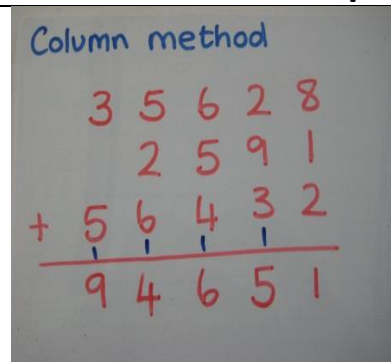
Year 6

- perform mental calculations, including with mixed operations and large numbers
- 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

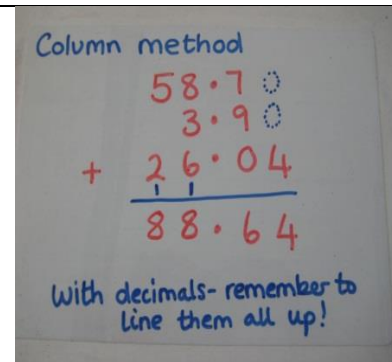
Representations we use for addition



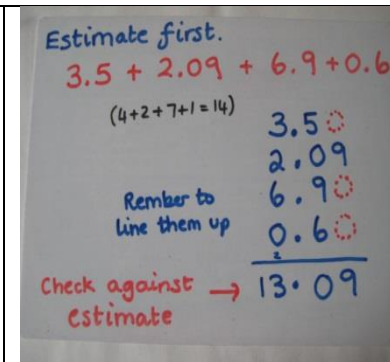
Often we need to calculate with smaller numbers very quickly when solving more complex problems. Number lines and other jottings, used in previous years, help keep those mental skills sharp. Quick mental calculations are practiced daily to keep those skills sharp.



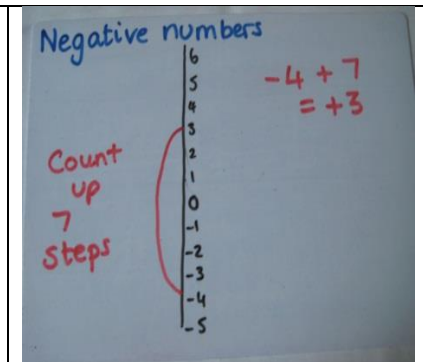
We can extend the column method started in Year 4 to add numbers up to a million using columns and exchanging or carrying.



When adding decimal numbers we begin by lining up all of the decimal places to ensure we are using the correct place value position. Sometimes it is helpful to add extra zeros to hold a column "open". This zero is called a "place holder".

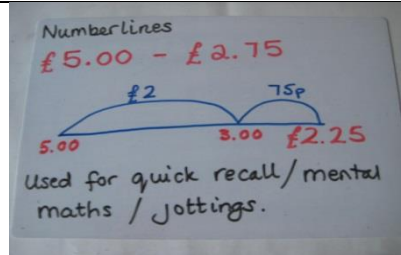


When calculating with decimals we are encouraged to estimate first, using our rounding skills. This then helps us check that final answer.....and not end up with 130.9!

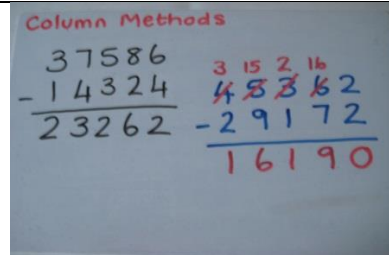


Number lines are also invaluable for calculating problems using negative numbers. We start by calculating in context such as a drop in temperature etc but move on to adding and subtracting 2 negative numbers together.....still showing how this happens on a number line.

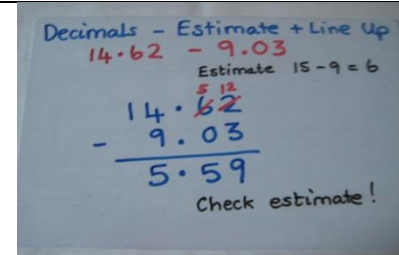
Representations we use for Subtraction



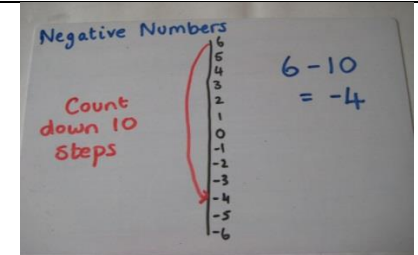
Often we need to calculate with smaller numbers very quickly when solving more complex problems. Number lines and other jottings, used in earlier years, help keep those mental skills sharp. Quick mental calculations are practiced daily to keep those skills sharp.



Having used place value counters and number rods a lot before, they have a much better understanding of the exchanging that is needed to subtract this way. The children are encouraged to look at the size of the numbers and choose the most efficient method i.e. you wouldn't do $2000 - 9$ this way!



Remember....estimate first then line up the decimal places.
Don't forget to check that answer!



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Multiplication and Division

Year 5

- identify multiples and factors, finding all factor pairs of a number, and common factors of 2 numbers
- know and use the vocabulary of prime numbers, prime factors and non-prime numbers (called composite numbers)
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits using a formal written method i.e. 345×78 , 4739×35
- 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 1,000
- recognise and use square and cube numbers, and the notation for squared (2) and cubed (3)
- solve problems involving multiplication and division including understanding the meaning of the equals sign

Year 6

- multiply numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication i.e. 2396×57
- 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 i.e. $7534 \div 19$
- 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
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- 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

Representations we use for Multiplication

THTU x T

$$\begin{array}{r} 3465 \\ \times \quad 4 \\ \hline 20 \text{ } 4 \times 5 \\ 240 \text{ } 4 \times 60 \\ 1600 \text{ } 4 \times 400 \\ 12000 \text{ } 4 \times 3000 \\ \hline 13860 \end{array}$$

A bridging method, started in Year 4, shows how each digit is multiplied individually and then their totals added together. Making sure you use the zeros to put the answer in the correct place value needs lots of practice before moving on. Using tables facts is equally important.

THTU x T

$$\begin{array}{r} 3465 \\ \times \quad 4 \\ \hline 13860 \end{array}$$

 £26.52

$$\begin{array}{r} 26.52 \\ \times \quad 3 \\ \hline 79.56 \end{array}$$

Soon they are ready to move onto a more compact method. Having previously used place value counters to develop an understanding of exchange this should come easily now.

THTU x TU
 Expanded:-

$$2654 \times 23$$

x	2000	600	50	4
20	40000	12000	1000	80
3	6000	1800	150	12

 Remember to line them up correctly.

$$\begin{array}{r} 40000 \\ 12000 \\ 6000 \\ 1000 \\ 1800 \\ 150 \\ 80 \\ 12 \\ \hline 61042 \end{array}$$

When beginning to multiply by more than one digit the children are encouraged to go back to using a grid to help them find all the combinations they need. They use these for multiplying decimals so making the switch is natural.

THTU x TU
 Compact method

$$\begin{array}{r} 2541 \\ \times \quad 23 \\ \hline 7623 \\ + 50820 \\ \hline 58443 \end{array}$$

 Children need to be very secure with place value + being able to "carry" in their heads.

Some children move onto a more compact method, but some continue with using a grid as they find it more logical.

Order of operations, squares + cubes.

$$(2^2 + 3^3 + 4^2) \times 2$$

$$(4 + 27 + 16) \times 2$$

$$47 \times 2 = 94$$

They also begin to use squared and cubed numbers as well as understanding using brackets and the order of operations. They will be introduced to these concepts through practical investigations.

Representations we use for Division

Compact method

$$5 \overline{) 639} \text{ r}4$$

During year 4 the children are introduced to this compact method so in year 5 they should become very secure using this. Using place value counters will help anyone to model this if they are unsure.

Compact method

$$3 \overline{) 4326}$$

 Children have lots of practice using place value counters alongside this until secure.

$$3 \overline{) 5239} \text{ r}1$$

Continuing using place value counters alongside written methods keeps the understanding at the fore front. We also extend this method to decimals too.

Long division

$$23 \overline{) 4862} \text{ r}9$$

 We use our tables knowledge.

$$\begin{array}{r} 2300 \\ 4600 \\ 262 \\ 230 \\ \hline 32 \end{array}$$

 or

$$23 \overline{) 4862} \text{ r}9$$

Long division is introduced last as this is significantly more difficult. It is linked to previous methods and the children are encouraged to use multiples of their tables to create bigger numbers to get closer to the number to share.

Slider boards

$$657 \div 100 \rightarrow 6.57$$

The children also consolidate using the slider boards to ensure they understand what happens when you multiply and divide by 10, 100, 1000 and 10 000.