Town Close School

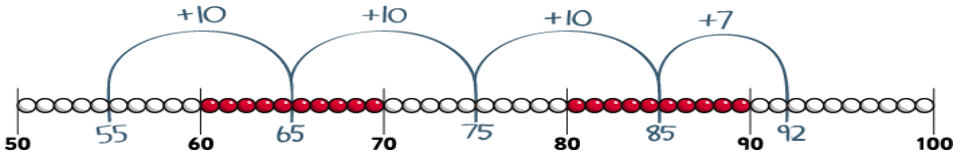
Maths Evening Handout

2018

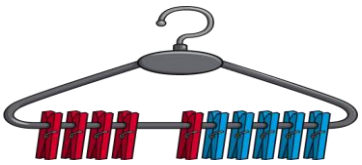
Workshop 1 - Addition

Addition Years 1 - 2

The key concepts that children learn in Pre Prep

1. Knowing 1,2 or 3 more than a given number.
2. Counting on in 1s and then 10s /multiples of 10 from a given number.
3. 

4. Partitioning groups of objects in different ways – before moving on to partitioning numbers in different ways.

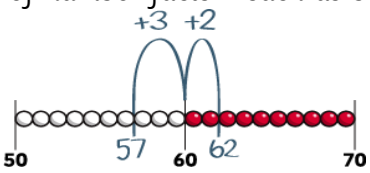


5. Recalling number facts such as doubles and number bonds.
6. Using their understanding of place value to add two or three digit numbers.

For more specific information on the National Curriculum requirements, please google ks1 maths national curriculum

How do we teach this?

- Manipulating groups of objects (including natural materials/fruit/toy animals/money). Partitioning the group in different ways.
- Using specialist maths resources such as Numicon, Unifix cubes and bead strings.
- Applying and developing our knowledge of number facts – such as bridging 10



- Using visual aids such as a hundred square and number lines or tracks (including rulers, track games and tape measures).
- Using computer software – particularly the Abacus Active Learn materials.

Which mathematical language do we use?

We introduce the relevant language such as:
'What is 10 more than 33?'
' What is the sum of 5, 7 and 10?'
'I have a 50p coin, a 20p coin and a 2p coin. How much money do I have altogether?'
'What is 3 plus 4?'
'If there are 6 boys and 7 girls in the class, what is the total number of children?'

How can you help at home?

Here are a few suggestions for supporting your child's learning of different addition strategies:

Play 'bond tennis' in the car. For example, if you want to practise bonds to 20, you say '17' and your child should quickly respond with '3'. Then they can pick a number up to 20 and you quickly say the corresponding bond to 20. This can be played with various multiples of 10/100. You could also vary it to develop recall of doubles and halves.

Play a variety of track games (such as snakes and ladders) as these develop the skill of counting on along a number line.

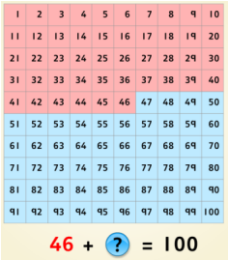
Sort out piles of coins and count them to work out the total amount.
Use different combinations of coins to show different ways to make a given amount.

Help to sort, partition and count the pieces of fruit in the fruit bowl.

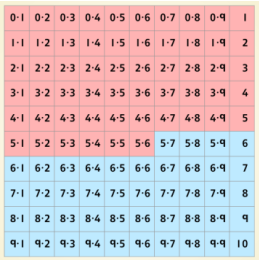
Try to keep maths practical and in relevant contexts so that children are ready to grasp more abstract number concepts as they move further up the school.

Most importantly: Make it meaningful and have fun!

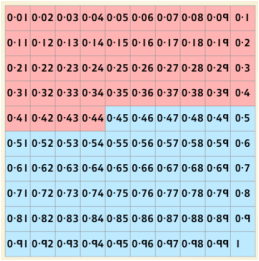
Addition - Mental Strategies Years 3 -6

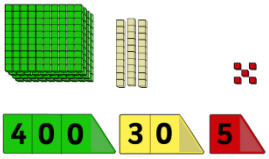


Finding number pairs to 100



Extending this to decimals, finding pairs to 1 (to include tenths and

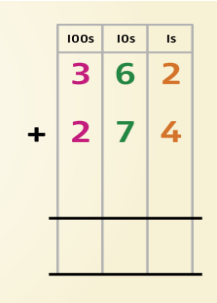




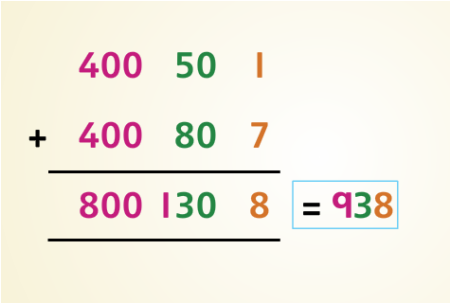
Secure knowledge of place value, using base 10 for support.

Extended to place value of decimals

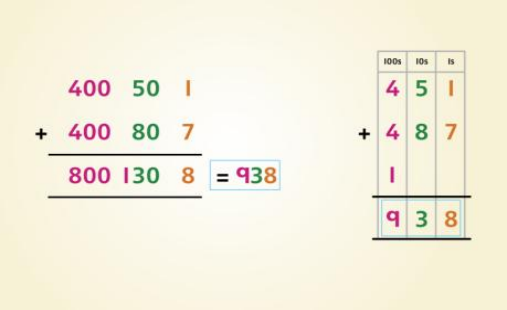
Addition – Written Strategies Years 3 - 6



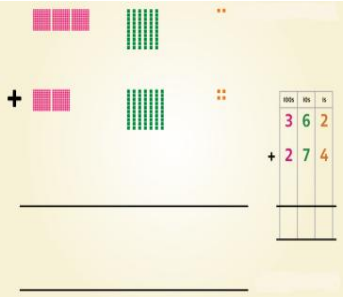
Partitioning using columns.

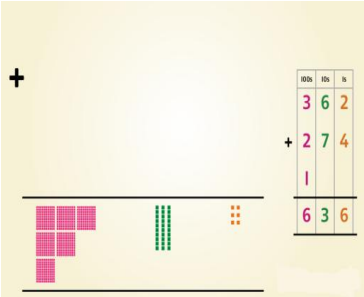


Beginning with the expanded method.

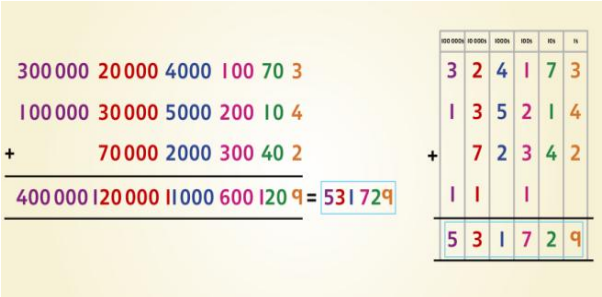


Linking the expanded method to the column method.

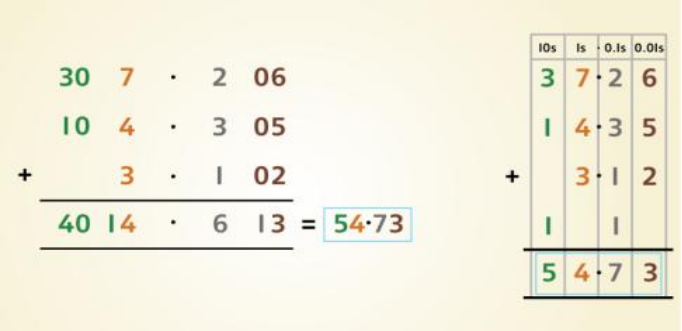


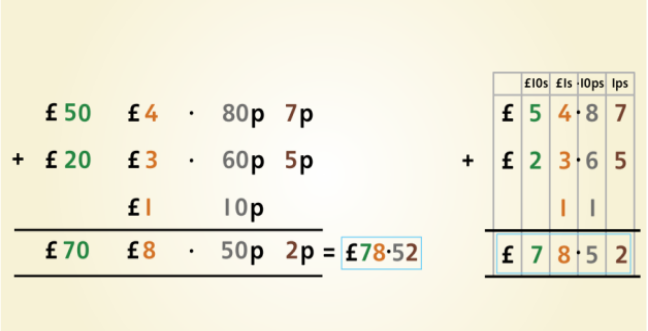


Using base ten for support - linking the base ten to column addition.



Column addition of larger numbers, using the expanded method for support, as





Extending the use of column addition to add decimals and money, using the expanded method as

Workshop 2 – Subtraction

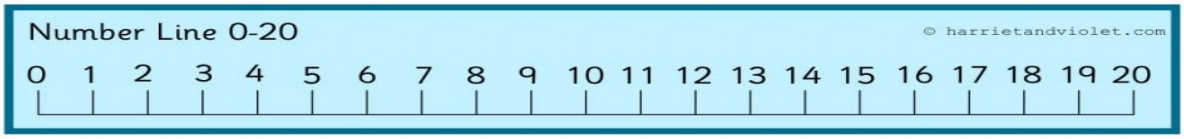
Subtraction Years 1& 2

Using physical resources

Children are encouraged at the beginning of Reception and continuing into Year One to use resources to aid their subtraction, physically taking away from an amount. Physical resources are a brilliant way of helping children to visualise what is a concrete concept and aids their understanding of subtraction processes. The term 'take=away' is introduced to children from an early age and using resources is a simple yet effective way for children to see what happens to groups of objects as they decrease in size. Objects that we use in school to help with subtraction include counters and counting bears but anything you have around the house that is fairly small and can be handled easily would work just as well.

Number lines

When children become confident with the idea of subtraction, more concise resources can be used to complete calculations, such as a number line.



A common misconception here is that children include the starting number when counting back e.g. they give the answer to 18 – 6 as 13.

100 square

We do lots of work in Year One and Two to enable the children to become confident with numbers to 100. A number square is laid out so that the number directly above is always ten less. Using a number square to count ten back from any two-digit number lays the foundations for the children to be able to complete this skill mentally.

Applying mental strategies

As the children become more confident at subtracting throughout Year One and into Year Two, we encourage them to start applying mental strategies. This begins at a basic level of subtracting one from any given two-digit number.

Children should be able to confidently count back in 10 from 100 by the end of Year 1.

100 > 90 > 80 > 70 > 60 > 50 > 40 > 30 > 20 > 10 > 0

By the end of Year 1 children most children are able to count back in 10s from any given 2-digit number.

57 > 47 > 37 > 27 > 17 > 7

Using jumps of 10 and 1

When the children have become confident in subtracting 10 and 1 from any given number, they are able to apply it to any subtraction calculation within 100, for example:

74 – 23 =

Mental solution

74-10=64

64-10= 54

54-3= 51

Once children become even faster within their mental application they will realise that they can complete the calculation quicker by subtracting the 10s in larger multiples. In the example above they will work out that they are able to subtract 20 with confidence before taking away the 3.

End of Key Stage 1 expected objectives for subtraction

- subtract any 2 two-digit numbers *using an efficient strategy*, explaining their method verbally, in pictures or using apparatus (e.g. 48 + 35; 72 – 17)
- recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships (e.g. If 7 + 3 = 10, then 17 + 3 = 20; if 7 – 3 = 4, then 17 – 3 = 14; leading to if 14 + 3 = 17, then 3 + 14 = 17, 17 – 14 = 3 and 17 – 3 = 14)

There are no further recommendations in relation to exceeding objectives for the end of Key Stage 1. This because it is paramount that children understand the concept and processes involved with numbers to 100 first before they develop different subtraction strategies involving larger numbers as well as minus numbers, fractions of numbers and so on.

Some children may not have met the expected outcomes for subtraction by the end of Year Two. This is not a problem – they will continue to work on the skills and methods they have been learning as they move into Prep.

It is worth noting that the phrasing for the objective uses the term ‘efficient strategy’ and backs this up by saying that children should be able to verbally explain their method. While we encourage the children to adopt the strategies outlined above, these are only suggestions and we want the children to be comfortable and confident with their calculations and use whichever method is easiest for them.

Vocabulary associated with subtraction

It is very important that children are exposed to the many different words and phrases associated with subtraction from the beginning of Year One. Try to vary the words you use with your children when talking about subtraction. Some of the main words are listed below:

Subtract, subtraction, minus, take away, decrease, take from, fewer, reduce, difference*, reduce.

*Difference

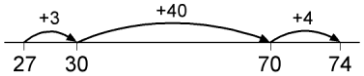
Young children, particularly those in Year One and Two, often struggle with the term ‘difference ’. We find that these often come up in tests and while we don’t ever teach to the test, it is important that children have a good understanding of what this means. One way in which they can enhance their understanding of this is by having two groups of practical objects, counting them and then working out the difference by applying known strategies.

Subtraction Years 3 – 6

The counting up method

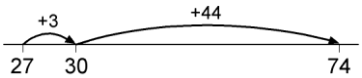
The mental method of **counting up** from the smaller to the larger number can be recorded using either number lines or vertically in columns.

The number of rows (or steps) can be reduced by combining steps. With two-digit numbers, this requires children to be able to work out the answer to a calculation such as 30 + ☐ = 74 mentally.



74
– 27
3 → 30
40 → 70
4 → 74
47

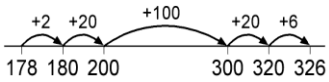
or:



74
– 27
3 → 30
44 → 74
47

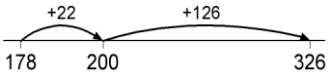
With three-digit numbers the number of steps can again be reduced, provided that children are able to work out answers to calculations such as 178 + ☐ = 200 and 200 + ☐ = 326 mentally.

The most compact form of recording remains reasonably efficient.



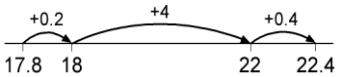
326
–178
2 → 180
20 → 200
100 → 300
26 → 326
148

or:



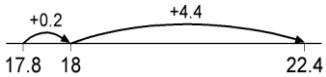
326
–178
22 → 200
126 → 326
148

- The method can be used with decimals where no more than three columns are required. However, it becomes less efficient when more than three columns are needed.
- This counting-up method can be a useful alternative for children who find column subtraction tricky.



22.4
–17.8
0.2 → 18
4.0 → 22
0.4 → 22.4
4.6

or:



22.4
–17.8
0.2 → 18
4.4 → 22.4
4.6

Decomposition and Column Subtraction is mainly taught in the latter stages of KS2, although children grasping the other concepts may be ready earlier. First the children are taught to 'decompose' or separate the numbers.

Decomposition

```
  8293 = 8000 + 200 + 90 + 3        (Decompose the two numbers)
- 1908 -  1000 + 900 + 00 + 8

                                    [You can't do 3 – 8 so must borrow 10 from 90]
       = 8000 + 200 + 80 + 13       [Hint: the bottom number never changes]
       - 1000 + 900 + 00 + 8

                                    [You can't do 200 – 900 and must borrow
       = 7000 + 1200 + 80 + 13      1000 from 8000]
       -  1000 +  900 + 00 + 8

         6000 +  300 + 80 + 5 = 6385
```

Column Subtraction

The children will then refine their method for decomposition using column subtraction instead. The children are taught to 'borrow' when they do not have enough in their column.

$$\begin{array}{r} {}^{8}\cancel{9}\,{}^{1}5 \\ -\ 2\ 8 \\ \hline 6\ 7 \end{array}$$

By the end of Year 6, children use column subtraction using larger integers or decimals.

Workshop 3 - Multiplication

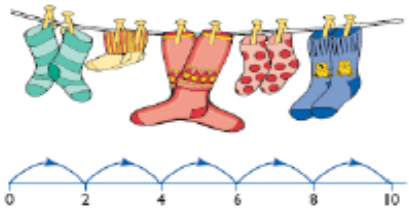
Multiplication Years 1 & 2

- **In Key Stage 1,** children need to begin to gain an understanding of multiplication as repeated addition.
- Pupils will be taught to count in 2s, 10s, 5s and 3s, and will relate this skill to repeated addition.
- The children will use practical equipment that promotes counting in equal groups.

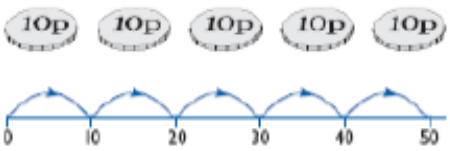
Multiplication as repeated addition

Relating practical equipment to equal steps along a number line.

Describing equal jumps along a number line using a repeated addition number sentence, multiplication number sentence and appropriate vocabulary.



2 + 2 + 2 + 2 + 2 = 10
5 X 2 = 10
5 groups of 2
5 hops of 2

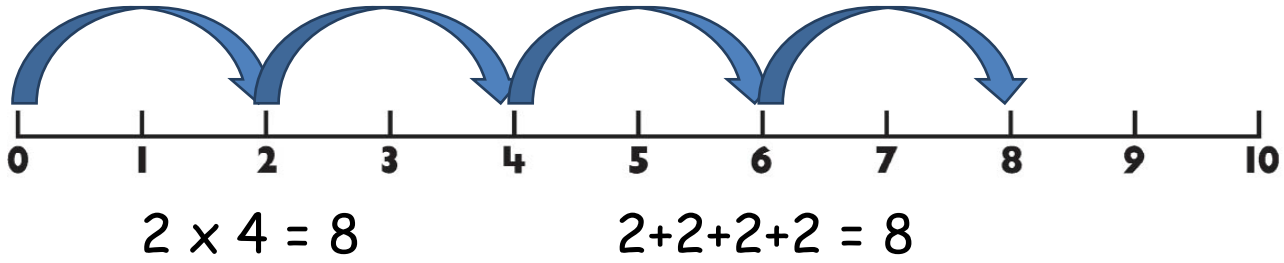


10+ 10 + 10 + 10 + 10 = 50
10 x 5 = 50
5 groups of 10
5 hops of 10

Multiplication using a number line.

Use a number line to model repeated addition, recording the equal jumps on the line. Model how to record the repeated addition number sentence this represents and then the associated multiplication number sentence.

When using a number line it is important that the children understand that 'multiplied by 4' or ‘X 4' means ‘add the number 4 times’.

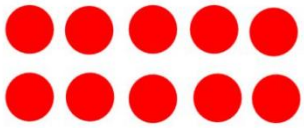


Key vocabulary

Multiply, multiplied by, times, lots of, groups of, repeated addition, rows and columns.

Multiplication arrays

Provide opportunities for children to create their own arrays from practical resources, for example ask them to count out 10 counters and then arrange them into groups of 2.



Then encourage them to count the counters in twos and in fives.

Encourage children to describe what they see when you show them an array. Use this opportunity to assess whether they are focusing on the rows and columns or whether they only see an array as a collection of individual objects.

Questions you may ask:

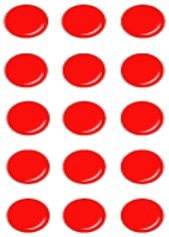
- How many rows are there? - How many in each row?
- How many columns are there? - How many can you see altogether?

As children suggest different ways of describing an array, model how these can be recorded mathematically as number sentences.
For example, ‘there are five counters in each row, there are three rows and there are 15 counters altogether’ could be recorded as repeated addition and a multiplication number sentence.

To help children move away from counting the number of objects in an array in ones, create an array and then cover everything except the first row and first column.

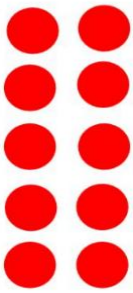
Ask the children to work out how many rows and columns are in the array and how many objects there are altogether.

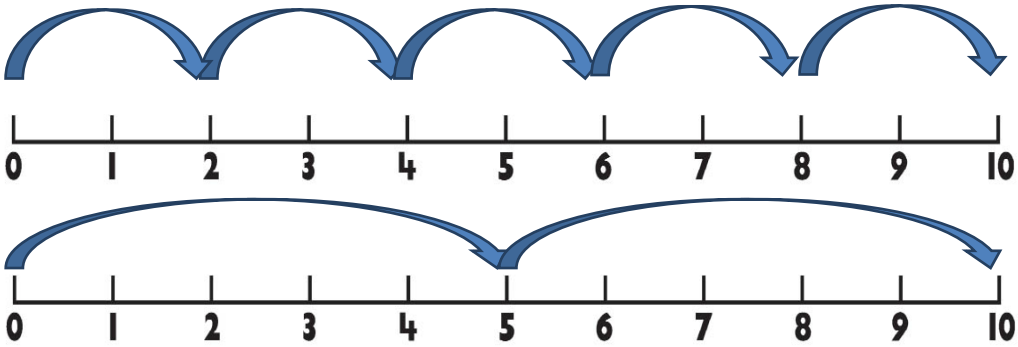
After showing children an array in one orientation, rotate it by 90° so that children see the columns and rows in the other orientation.



Relate arrays to counting in equal steps along a number line, for example show how the following array can be recorded as

2 + 2 + 2 + 2 + 2 (2 x 5) **OR** 5 + 5 (5 x 2)





Give children a multiplication sentence such as 4 × 2 = 8 and ask them to make an array to go with it. Then ask them whether there are any other number sentences they can write to go with it using the correct mathematical vocabulary.

Multiplication Years 3&4

Grid Method

The grid method is used in Years 3 and 4. When you use the grid method, you break up the number (partition) into hundreds, tens and units (ones). Multiply each separately and then add the answers together. It is beneficial that children have good knowledge of times table and multiplying by multiples of 10.

Example

To calculate 35 × 7, you need to partition 35 into tens and units (ones). Then set it out in a grid like this:

×	30	5
7		

Multiply each pair of numbers and write them in the grid. Then add the two products (answers to the multiplications) to find the answer.

×	30	5
7	210	35

210 + 35 = 245

The grid method can also be used for more difficult multiplications, such as 35 x 26.

×	30	5
20	600	100
6	180	30

600 + 100 = 700
180 + 30 = 210

700 + 210 = 910

Multiplication Years 5 & 6

- Children learn how to detect multiples

  eg Multiples of 2 Even

  Multiples of 3 Digits add up to 3, 6, 9 etc

  (432 is a multiple of 3 as 4 + 3 + 2 = 9)

  Multiples of 4 Halve the number and the answer is even

  Multiples of 5 Numbers ends in 5 or 0

  Multiples of 6 Even and the rule for multiple of 3

  Multiple of 8 Halve the number twice and the answer is even

  Multiple of 9 Digits add up to 9, 18 etc

- Children find factors of numbers by multiplication (factor pairs)

eg 60	72
1 x 60	1 x 72
2 x 30	2 x 36
3 x 20	3 x 24
4 x 15	4 x 18
5 x 12	6 x 12
6 x 10	8 x 9

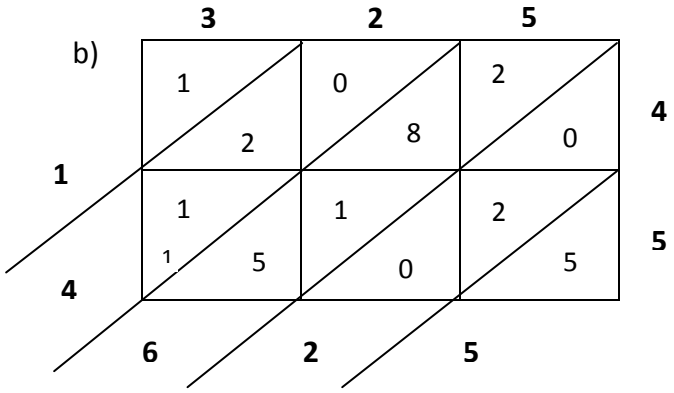
- Long Multiplication using a) Column Method

  b) Lattice Method

a) 325 x 45

```
   3 2 5
     4 5 x
 1 6 2 5
1 3 0 0 0
1 4 6 2 5
```

b)



- Useful online activities

  Arcademicskillbuilders - racing cars around a circuit

Workshop 4 Division

Division Years 1-2

In Years 1 and 2, children should understand 3 main concepts about division:

1. Division is the inverse of multiplication
2. Division is a 'sharing operation'
3. Simple fractions: Halving is the inverse of doubling and you can halve odd numbers.

1.The relationship between multiplication and division:

It is important for children to understand that division is the inverse of multiplication. We do a lot of 'Clever Counting' (and learning the 2, 5 and 10 times tables).

Children should know that ☐ x 5 = 15 means 'How many lots of 5 make 15?'. They learn that this could also be written 15 ÷5 = ☐

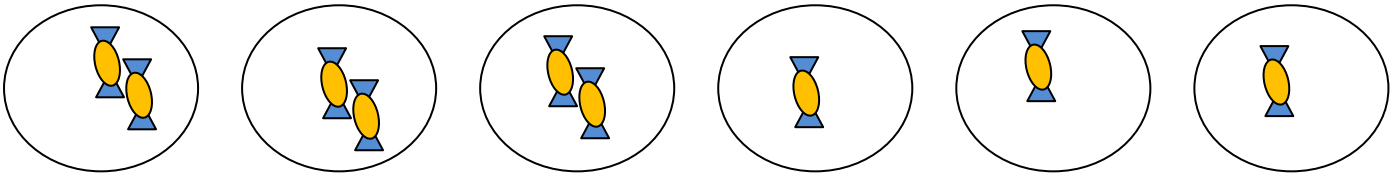
To solve this type of problem, children are taught to count in 5s up to 15 (using their fingers to help count 3 lots of 5 make 15). Children should be able to confidently solve problems such as 'How many lots of 2 is 22?' or 'How many lots of 10 is 70?'

2. Division as sharing:

Children should understand that division is also a 'sharing operation'.

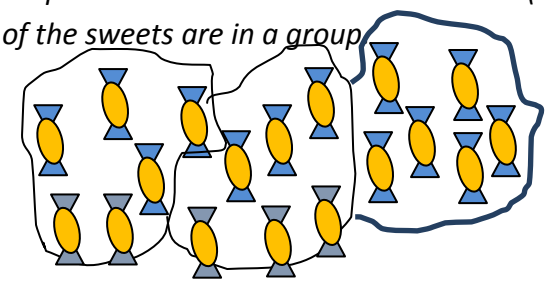
There are 24 sweets in a bag and 6 children. Share the sweets equally among the six children. How many sweets will each child get?

Children will use sharing to answer this question. Most young children will share the sweets one at a time between the 6 children. They will be taught to draw out 6 circles and put 1 in each then 2 etc.



There are 18 sweets. Each party bag needs 6 sweets. How many party bags can be filled?

Children will need to use grouping to answer this question. The most common way children are taught to represent this is to draw out 18 sweets (or dots) and put rings around groups of 6 until all of the sweets are in a group.



3. Introducing fractions:

Children learn that halving means sharing equally between 2 groups and that quartering is sharing equally into 4 groups. This concept is introduced using practical activities (such as sharing ‘paper pizza toppings’ equally between 4 slices of pizza or using a variety of different fruit at snack times).

In Year 2 children learn to halve odd numbers up to 20. Children should be able to recall ‘halving facts to 20’ at speed. We often practise this using a ‘quick fire whiteboard quiz’ at the beginning of maths lessons. They should also understand that halving is the inverse of doubling.

In Year 2 children learn to count in halves and quarters. They are also expected to read and write halves, quarters and thirds. They will begin to solve problems such as ‘What is a quarter of 12?’ or ‘What is three quarters of 16?’. They are taught to ‘halve and halve again’ to find a quarter.

Division Years 3 & 4

Counting:

- Using a number line or hundred square to count on and back in different number sequences
- Number resources in the classroom (eg. times tables sequences and grids)

Doubling and halving:

- Partitioning
  Example: half of 24 = half of 20 (10) add half of 4 (2) = 12
  - ÷ 2 ÷2 ÷ 5 ÷3 Divide by these numbers

    x 2 ÷4 ÷ 10 ÷ 6 Halve again

    ÷8 Halve again

- Grouping and sharing: revising and building on practical strategies used in KS1
- Useful resources to use at home:

  counters, coins, multiplication grids
- Practise times tables!
- Vocabulary for ÷

  eg. share, groups of, divide equally

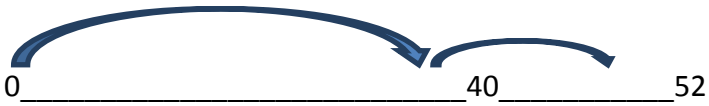
- Inverses

  Example: 6 x 4 = 24 so:

  24 ÷ 6 = 4 and 24 ÷ 4 = 6

- "Chunking" on a number line

52 ÷ 4



0 to 40 " 10 (groups of 4)" 40 to 52 "3 (groups of 4)" "altogether 13 (groups of 4)"

45 ÷ 3

0 to 30 "10 (groups of 3)" 30 to 45 "5 (groups of 3)" "altogether 15 (groups of 3)"

Division Years 5 & 6

Mental

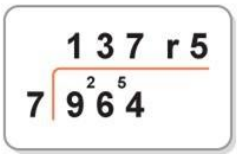
- Know by heart all the division facts up to
  144 ÷ 12
- "Shifting Columns" – eg. 126 divided by 10 = 12.6, 3246 divided by 100 = 32.46, 70034 divided by 1000 = 70.034
- "Short Cuts" – 80 divided by 5 = (80 divided by 10) X 2 = 16
  90 divided by 6 = 45 divided by 3 = 15
  Tests of divisibility eg. Does 4683 divided exactly by 3? Yes, because 4 + 6 + 8 +3 = 21 and 21 divides by 3
  672 divided by 8 = 672 divided by 2 divided by 2 divided by 2 = 336 divided by 2 divided by 2 = 168 divided by 2 = 84
- "Partitioning" – Find half of £35.90. First find half of £35 = £17.50, then find half of 90p = 45p, then add the two answers together = £17.50 + £0.45 = £17.95
- "Beyond whole numbers" (but using tables knowledge) – 2.4 divided by 6 = 0.4 , 0.63 divided by 9 = 0.07 , 42 divided by 70 = 0.6

Written

- BUS STOP method

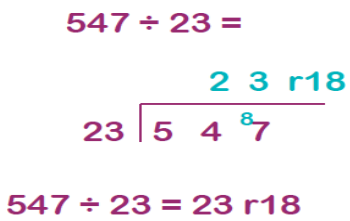
Small divisors

Use tables knowledge



Large divisors

Use 'easy multiples' table at the side

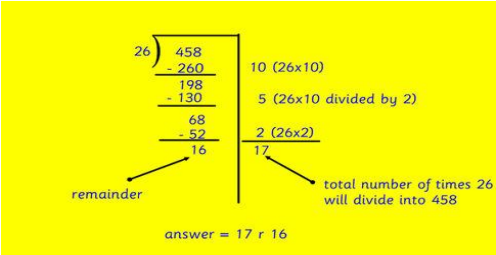


1	23
2	46
4	92
5	115
8	184
10	230

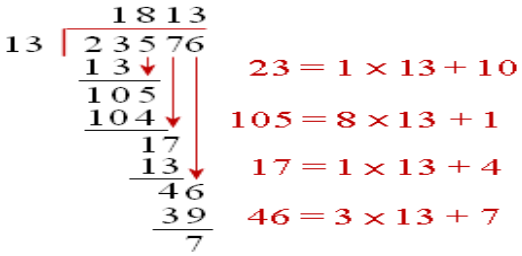
The table at the side is built up in this order: 1 X 23 = 23, 10 X 23 = 230, 5 X 23 = 115 (half of 230), 2 X 23 = 46 (double 23), 8 X 23 = 184 (double 92).

In this case, the table is then used to decide how many complete lots of 23 divide into 5 (zero), then 54 (2 because, from the table, 2 X 23 = 46) and then 87 (this is harder, because, looking at the table it could be 2 or it could be 3 (4 X 23 =92 is too big). At this stage you probably need to work out 23 X 3 = 69 and see that this is indeed the answer because it is less than 87). The remainder is worked out from 87 – 69 = 18

- Chunking Method – Essentially the same as the method used in Years 3 & 4, but recording down the page and using the idea that division is ‘repeated subtraction’.



- Long Division – This traditional method has ‘come back into fashion’ and, indeed, is positively encouraged by those responsible for setting the Key Stage 2 SATs. We are a bit wary of it because it takes a long time. It also involves carrying out several subtraction calculations, a source of probable errors by children not completely secure with subtraction. Finally, it is quite difficult to explain to children why it works (though it is essentially the same method as the one outlined above for ‘Large Divisors’.)



- **All the written methods take longer to complete than those for addition, subtraction or multiplication; therefore, children tend not to complete enough examples to secure mastery and practising the methods at home is very useful.**

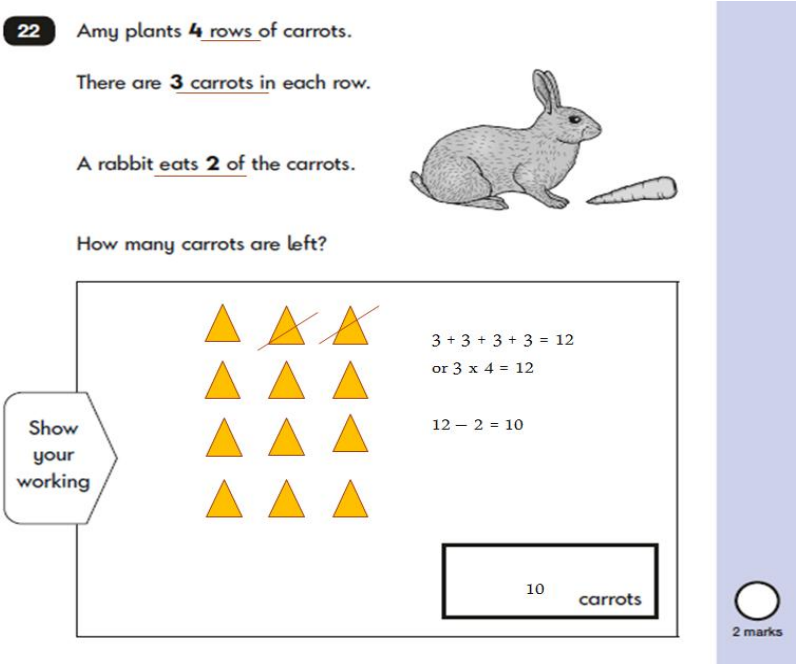
Workshop 5 – Problem Solving and Reasoning

Problem Solving and Reasoning Years 1-2

- Most children come from the EYFS with a developing ability to perform simple addition and subtraction calculations.
- These calculations are normally expressed as a number sentence, with which children have a concept of the +, - and = mathematical symbols.
- Key Stage One builds upon this, as well as teaching children how to perform multiplication and division calculations.
- When it comes to solving problems, it is not the calculation that causes the biggest issue.

Solution!

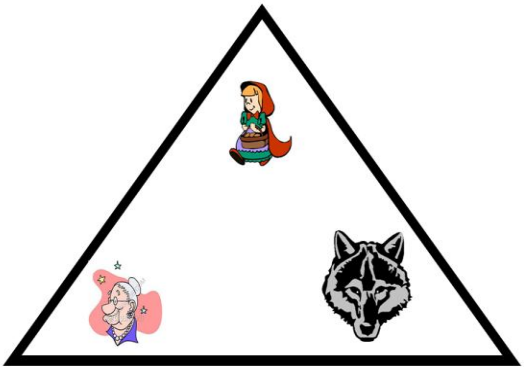
- Although a lot of the time in Maths there is a right/wrong answer, problem solving is slightly different. There may be multiple answers or different strategies to solve them.
- Therefore positively encouraging your child to 'have a go' is fundamental to building children's confidence with numbers from an early age.
- Trying to link mathematical problems to everyday life helps the children build upon what they already know and thus they can begin to make contextual links (so as long as the problems are realistic!).
- Reading a problem, finding the important words and then drawing a picture often helps children.



Reasoning - Who, what or which one is the odd one out?

- To be able to reason children should be able to speculate and offer a proof and explanation of their ideas. They should be able to form links between mathematical ideas and be able to apply and test these.
- When you ask children to suggest the odd one out and they explain their reasoning – anything goes!
- The following are just some examples where children can reason and explain their thinking– the possibilities are endless.....

Odd one out?

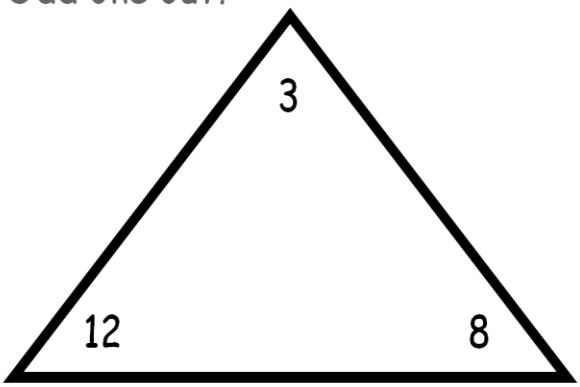


Possible answers...

Wolf – because it's an animal
Grandma – she's the only one with false teeth
LRRH – because she's the youngest
Grandma – because she's the oldest
Wolf – because he has fur not skin

The possibilities are endless.

Odd one out?



Possible answers...

3 – it's odd
8 – it's not in the 3x table
3 – it's not divisible by 2 or 4
12 –it's a 2 digit number
12 – it's the biggest
3 – it's the smallest
Use any numbers you wish.
The possibilities again are endless!

Noah

Answer (assuming no flamingos were hopping into the ark!)

2 2 2 2 2 2

2 2 2 2 4

2 2 2 6

2 2 4 4

2 4 6

4 4 4

6 6

8 2 2

8 4

Problem Solving and Reasoning Years 3 -6

Why is it important?

- Ability to generalise
- Independence and perseverance
- Capacity to learn and understand new ideas and quick ways of working
- Effective communication
- Ability to reason mathematically

Problem solving is:

- Seeking solutions, not just memorising procedures
- Exploring patterns, not just memorising a formula
- Formulating conjectures, not just doing exercises

Problem solving uses activities such as:

- Finding all possibilities
- Word problems
- Logic
- Visual exercises
- Rules and patterns
- Proving Statements

Possible Reasoning Activities

Always, Sometimes, Never Give the children a statement and then ask whether it is always, sometimes or never true.	**Another, Another, Another** Give the children a statement and ask them to give you examples that meet the statement. Then ask for another example, and another…	**Convince Me** Make a statement to the children and ask them to decide whether it is accurate or not, then explain their reasoning to convince you.
Hard Easy Ask the children to give you an example of a 'hard' and 'easy' answer to a question, explaining why one is 'hard' and the other 'easy'.	**If this is the answer, what's the question?** Give the children an answer and ask them to come up with as many questions as possible that could have the answer.	**Maths Stories** Give the children a number, geometry concept or measure and ask them to write its 'story', that is as much as they know or can work out.
Odd One Out Give the children a set of three or more numbers or statements and ask them to identify which number/statement is the odd one out and why.	**Peculiar (strange), Obvious, General** Ask the children to give a peculiar, obvious and if they are able, general, example of a statement.	**Silly Answers** Ask the children to give you a 'silly' answer to a question and explain why it is a silly answer.
What do you notice? Ask the children, 'What do you notice?' about a number, set of numbers, shape or mathematical statement.	**What else do we know?** Give the children an 'If…' statement, e.g. if 2+ 8 = 10, ask them what else they know based on this statement.	**What's the same? What's different?** Give the children at least two statements, objects or numbers and ask them to compare them by asking, 'What's the same? What's different?'
Zooming in Ask the children to give you an example that fits with a given criteria (e.g. an odd number) and then 'zoom in' to give further criteria which their number has to fit (e.g. an odd number which is also greater than 10).		

Reasoning Examples - Year 2

Always, Sometimes, Never Is it always, sometimes or never true that a picture on a pictogram represents one piece of data?	**Another, Another, Another** Can you give me an example of a 3D shape? Another, another, another…	**Convince Me** Convince me that… addition and multiplication are linked
Hard Easy Give me a hard and easy number to find half of.	**If this is the answer, what's the question?** If the answer is 8 girls, what could the possible question be?	**Maths Stories** The story of 20.
Odd One Out £2, 2p, 50p, 20p, 10p, 70p: which is the odd one out?	**Peculiar (strange), Obvious, General** Give me a strange, obvious and general example of a fraction of a number.	**Silly Answers** Give me a silly answer for a unit to measure the side of a book.
What do you notice? What do you notice about a square?	**What else do we know?** If we know 32 + 32 = 64, what else do we know?	**What's the same? What's different?** What's the same and what's different between cm and m?
Zooming in Give me a number in the 5 times table.		

Reasoning Examples Year 4

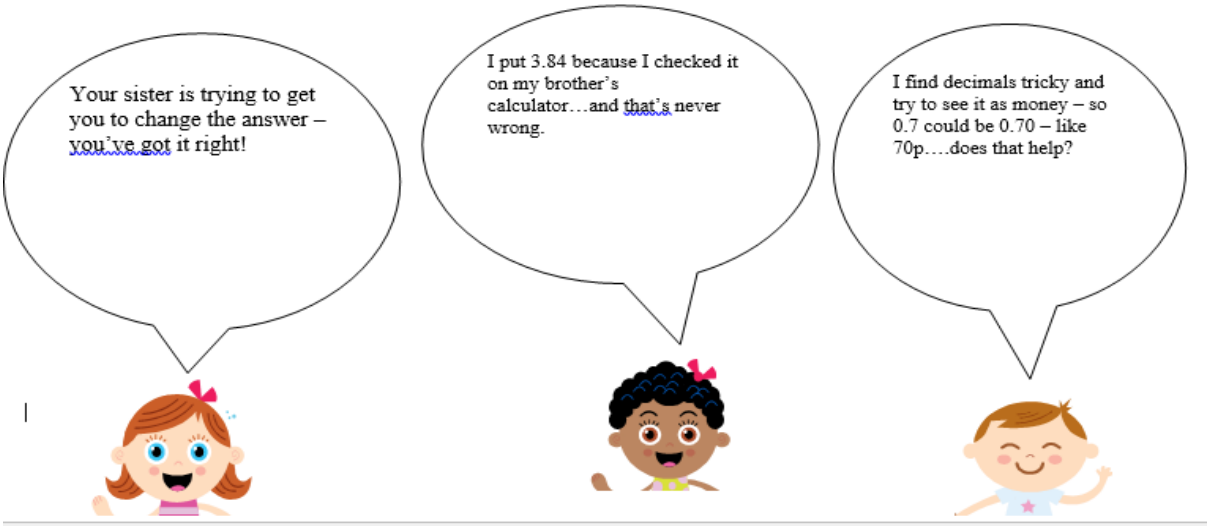
Always, Sometimes, Never Is it always, sometimes or never true that rectangles with the largest perimeters have the biggest areas?	**Another, Another, Another** Can you give me an example of a number less than 1? Another, another, another…	**Convince Me** Convince me that… 1000cm = 10m
Hard Easy Give me a hard and easy example of a sequence of numbers.	**If this is the answer, what's the question?** If the answer is ¾, what could the possible question be?	**Maths Stories** The story of 25.
Odd One Out Look at this set of numbers: 30, 20, 36, 3. Which is the odd one out?	**Peculiar (strange), Obvious, General** Give me a peculiar, obvious and general example of a fraction.	**Silly Answers** Give me a silly answer for another way of expressing 8 x 7 = 56.
What do you notice? What do you notice when you multiply by 100?	**What else do we know?** If we know that one side of a pentagon is 7cm long, what else do we know?	**What's the same? What's different?** What's the same and what's different about 2/5 and 4/10?
Zooming in Give me a decimal number.		

Reasoning Examples Year 6

Always, Sometimes, Never Is it always, sometimes or never true that the angles in a triangle add up to 180º?	**Another, Another, Another** Can you give me an example of a pair of shapes whose areas differs by 4? Another…	**Convince Me** Convince me that… the diameter of a circle is twice its radius.
Hard Easy Give me a hard and easy example of a 5-digit addition.	**If this is the answer, what's the question?** If the answer is 2:4, what could the possible questions be?	**Maths Stories** The story of 64.
Odd One Out Look at these calculations: a x b = b x a, b + a = a + b, b – a = a - b Which is the odd one out?	**Peculiar (strange), Obvious, General** Give me a peculiar, obvious and general example of a parallelogram.	**Silly Answers** Give me a silly answer for an equivalent percentage and decimal to 4/5.
What do you notice? What do you notice about these sets of numbers: 160, 240, 320? What will the 5th number of the sequence be?	**What else do we know?** If we know that b x a = c, what else do we know?	**What's the same? What's different?** What's the same and what's different about a rhombus and a square?
Zooming in Give me a fraction greater than 0.8.		

I've just checked my homework and my sister says that number 10 is wrong!!

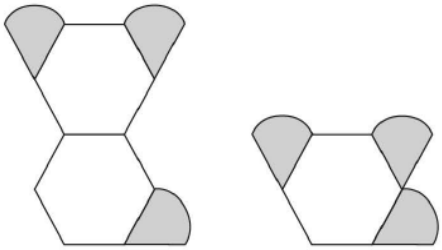
$$3.14 + 0.7 = 3.21$$



KS2 SATs maths tests consist of one paper assessing arithmetic, and two papers assessing reasoning where children have to apply mathematical skills to a wide range of problem solving questions. Recent example SAT questions include:

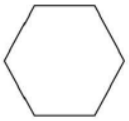
21 Amina is making designs with two different shapes.

She gives each shape a value.



Total value is 147 Total value is 111

Calculate the value of each shape.



= _____ 1 mark

= _____ 1 mark

11 Here is a rule for the time it takes to cook a chicken.

Cooking time = 20 minutes plus an extra 40 minutes for each kilogram

How many minutes will it take to cook a 3 kg chicken?

minutes 1 mark

Workshop 6 – Mental Maths and Times Tables

Mental Maths

Mental maths does not need to be carried out entirely in your head. There are several ways of carrying out mental calculations: using paper and pencil methods, working them out mentally or a combination of these. Informal recording and the use of tools such as number lines and hundred squares can be used to develop understanding of number and help to develop competence and confidence for mental calculation at all stages.

Children should be encouraged to identify the range of methods and strategies they can use to solve questions.

Known Number Facts

Number bonds (pairs of numbers) can be used to work out calculations more efficiently. Eg 4 + 3 + 6 = 13

Doubles knowledge helps efficient working out eg 6 + 3 + 6 = 15

Using knowledge of near doubles eg 6 + 7 = 13 Work out that double 7 is 14 minus 1 OR double 6 is 12 add 1.

If a child knows that 6 x 4 = 24 then they can apply this information to a range of problems eg

60 x 4 = 240 12 x 4 = 48 60 x 40 = 2400

Visualising Numbers

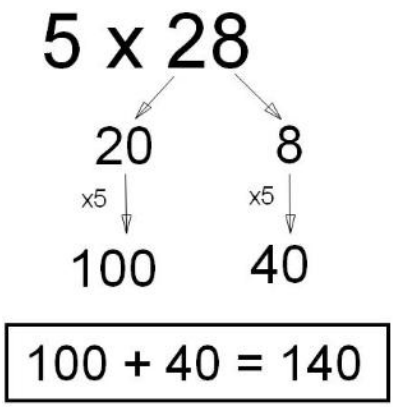
Children should be able to picture a numberline in their heads.

Useful resources for counting: http://www.primarygames.co.uk/pg2/splat/splatsq100.html

https://mathsframe.co.uk/en/resources/resource/37/placing_numbers_on_a_number_line

Partitioning

Children can use their knowledge of place value to partition numbers. This will make solving questions more manageable.



Nearly Numbers

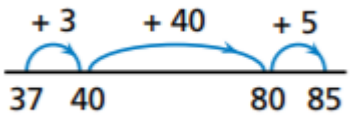
E.g. 599 + 67

=600 + 67 – 1 = 666

Bridging

Bridging can be used to break questions into more simple steps.

85 – 37



Times Tables

• Seeing a times table as repeated addition is useful. For example, 4 x 5 is the same as 5 + 5 + 5 + 5.

• Understanding that times tables are commutative, so that both 5 x 4 and 4 x 5 = 20, is vital to speedy recall as it reduces the 'amount' of learning to one third of its original.

• Multiplication should be recognised as the inverse of division. The number sentence or calculation 20 ÷ 5 = 4 can be worked out because 5 x 4 = 20.

• Different times tables have different patterns within them, which make learning them much easier.

Year 4 Times Tables Test

The multiplication tables check is designed to help ensure children in primary school know their times tables up to 12 off by heart. As well as being critical for everyday life, knowledge of multiplication tables helps children to solve problems quickly and flexibly, and allows them to tackle more complex mathematics later on in school.

In the primary assessment consultation run by the government last year, the majority of the sector said that Year 4 would be the best point to run a check on progress being made.

Fun methods for learning….

Websites:

https://www.transum.org/Tables/Times_Tables.asp

https://www.topmarks.co.uk/maths-games/7-11-years/times-tables

https://www.timestables.co.uk/6-times-table.html

Workshop 7 Sumdog and Active learn

Sumdog

https://www.sumdog.com/

- The Sumdog website or App above can be used to motivate pupils to practice their mathematics through online games
- The progress of pupils can be monitored by an adult who are able to set challenges and tasks to be completed
- Each time a pupil masters a skill, their proficiency level increases and the programme generates questions accordingly
- All the questions are displayed in a multiple choice format with four possible answers
- Children can play against each other and school competitions can be set.

Activelearn

https://www.activelearnprimary.co.uk/

- The Active Learn website above complements the Abacus scheme of work that is followed at Town Close
- Teachers are able to set tasks linked to the learning topics covered in class
- Pupils can log in (using their personal login details) and complete these and teachers can view their results.

Additional Mathematical Websites & Apps

Websites

www.topmarks.co.uk A range of maths activities

BBC Bitesize KS1 (Years 1 &2) **- https://www.bbc.com/bitesize/subjects/zjxhfg8**

BBC Bitesize KS2 (Years 3 - 6) - https://www.bbc.com/bitesize/subjects/z826n39

http://www.math-drills.com/ A wide range of printable worksheets (Years 3 - 8)

https://www.arcademics.com/ Online maths games based on building speed of core facts.

Enrichment activities

http://nrich.maths.org

Apps

Sumdog

Prime Smash
Free by Panasonic – Learn prime numbers and factors in a fun way.

Squeebles (Multiplication, Times Tables, Fractions, Tell the Time, Division, Maths Race, Addition and Subtraction) A well presented app for the core skills, each individual app costs around £3-4 each. (Years 1 – 6)

IXL – covers all topics and suitable for all year groups.
Payment needed for the full version. The free app limits the number of questions you can answer each day (Years 1 – 8 and beyond)

Times Table Rock Stars

King of Maths - Another good app to revise the 'four rules' (Years 1 to 6)