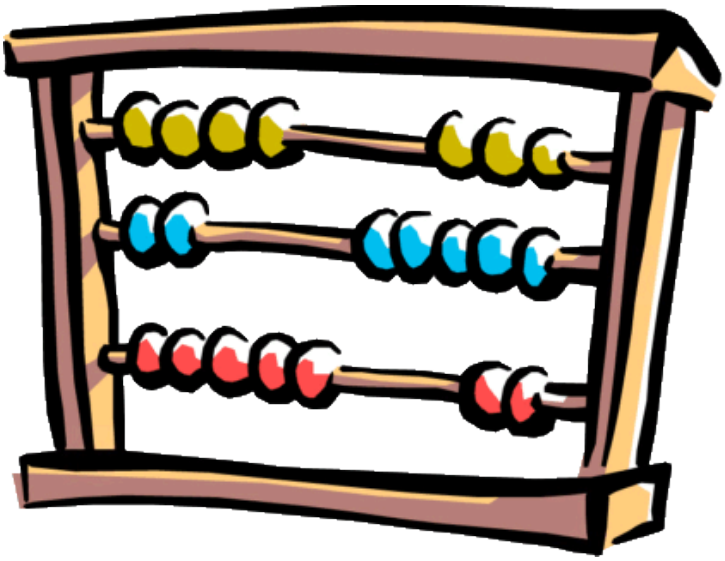
Family Maths Support



Year 3

Norton Junior School

2016

Introduction

As a school we understand that many parents/carers are keen to support their children in mathematics and this has led to many families requesting to know the methods that we use to teach their children. As a consequence, we at Norton Junior School have produced this booklet to support families in helping develop their child's methods of calculation.

Overview

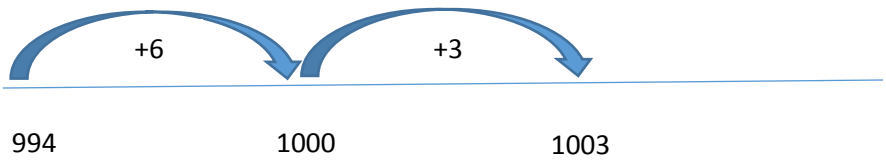
The ability to calculate mentally forms the basis of all calculations and therefore, particularly through years 3 and 4, the focus in school is on teaching these mental methods. Here, we endeavour to help each child to be 'comfortable' with number, have a solid understanding of the relationships between them, and be proficient in both written and mental methods of calculation. To achieve this, we aim to help develop children's mental strategies so that they can round, approximate, calculate and check the reasonability of their answers. Therefore, when a child is faced with a calculation problem we encourage them to approach it in the following way by asking themselves:

- Can I do this in my head?
- Could I do this in my head using drawings or jottings to help me?
- Do I need to use a written method?
- Should I use a calculator?
- Is my answer reasonable and is it close to my estimate?

As the pupils become more confident, their mental strategies will increase in speed and accuracy and at this point the child will be exposed to more formal written methods of calculation. Using this process as our teaching model ensures that our children have confident metal strategies as well as having a reliable written method of more difficult calculations which they cannot do mentally. However, it is important that this model is followed as children all too often default to a formal written method before they have attempted the calculation using a mental method. Consider the subtraction calculation below, for example:

1003 – 994

If a child is comfortable with these numbers they will recognise that they are relatively close together and if one was to count up from the smallest number then they would quickly realise that the numbers have a difference of 9. For example:



From a developmental point of view the worst possible thing here would be for a child to approach this using a traditional written method which would be unnecessary. For example:

1003

994 -

To perform the first step in this calculation (3-4) the child would have to start to 'borrow' from the tens column. As the number is 0 in this column the child moves along again and again as the number in the hundreds column is also 0. As you can imagine this starts to get a little complicated and could have easily been avoided had the chid recognised how close together the numbers were.

Similarly, this is also the case with addition calculations where unwittingly children use formal written methods too soon. Consider the calculation below, for example:

27 + 15

Here we would expect the child to start the questioning process mentioned above, 'can I do this in my head?' If that was the case there are a number of strategies the child may use, for example:

By partitioning into tens and units

20 + 10 = 30

7 + 5 = 12

30 + 12 = 42

Or….

….by using an empty number line

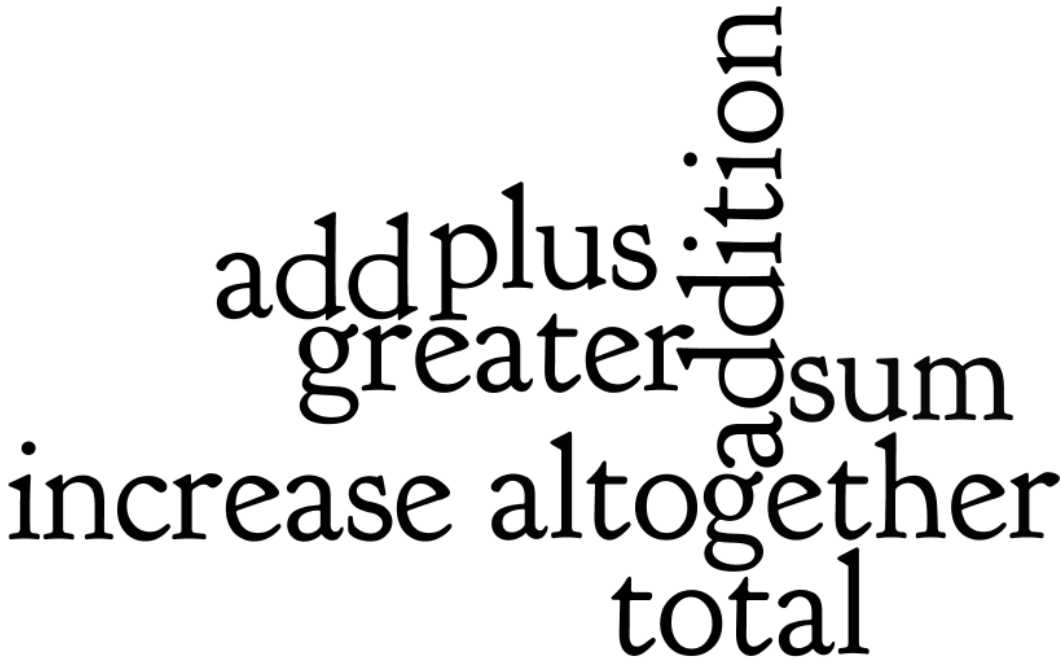
And finally…

….by Compensation (in this case adding to one number and taking from another to make the calculation easier)

(27 + 3) + 15 – 3 becomes 30 + 12 = 42

Let it be clear, however, that this is not a slight on the methods parents/carers are showing their children or indeed the method itself as it is one that will be taught at some stage through school. But, what is important, is the timing of when the material's taught as only when children are comfortable with a number of different calculations and the mental methods that are required to calculate them will they be exposed to more formal written methods. The benefits of using this model for your child are vast as it helps refine their methods of calculation, allows them to be more comfortable with the value of number and more importantly understand the relationships between them. Using only written methods makes calculations purely 'mechanical' and whilst there is a place for these methods within school, it is not until your chid has efficient mental strategies.

It is also important to understand that children's brains function in very different ways and that a variety of strategies are used to perform similar calculations like the addition problem above. Therefore, the methods shared with you in the following pages are all examples of what we teach in school and can therefore be used as a guide to reinforce your child's learning at home. We hope that you find these methods helpful, and trust that you will bring any questions regarding our policy or your child's learning to the school as above all, at the heart of what we do, is the progress of your child.



Mental Method 1

Partitioning

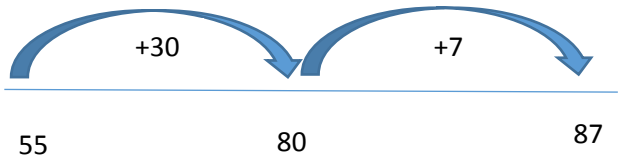
e.g. 55 + 37

50 + 30 = 80
5 + 7 = 12
80 + 12 = 92

Mental Method 2

Counting up from the biggest number on a number line

e.g. 55 + 37



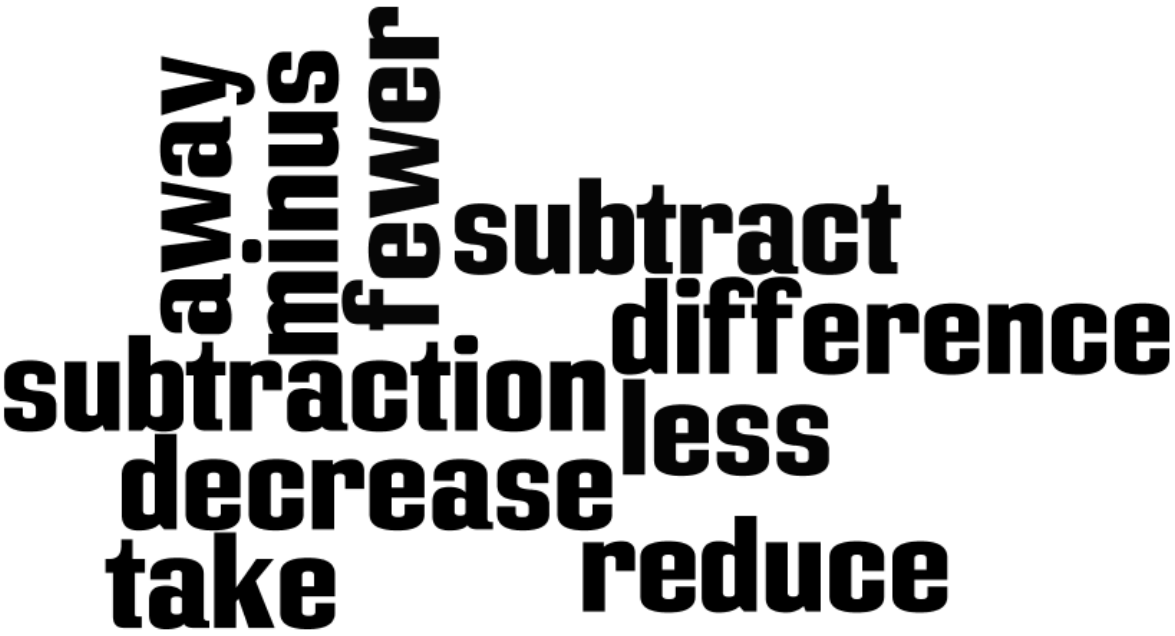
Pencil and paper procedures

e.g. 367 + 185 = 431

300 + 60 + 7
100 + 80 + 5
400 +140+12 = 552

Leading to:

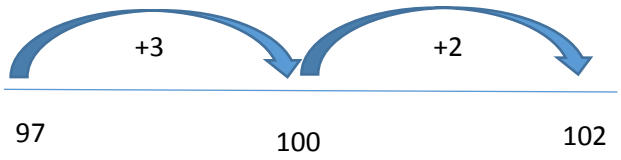
3 6 7
1 8 5 +
5 5 2



Mental Method 1

Find a small difference by counting up using complementary addition

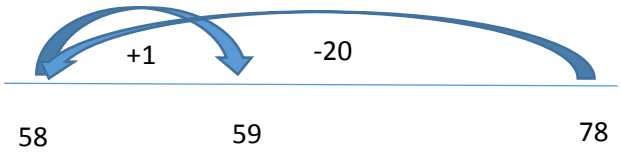
e.g. 102 – 97 = 5



Mental Method 2

Subtract mentally a 'near multiple of 10' to or from a two-digit number

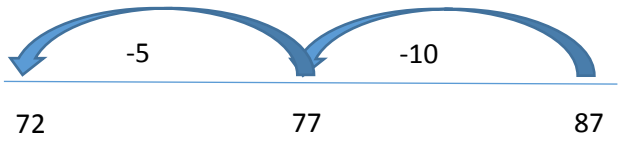
e.g. 78 – 19 is the same as 78 – 20 + 1 = 59



Mental Method 3

Use known number facts and place value to subtract

e.g. 87 – 15 = 72



Leading to subtraction by decomposition:

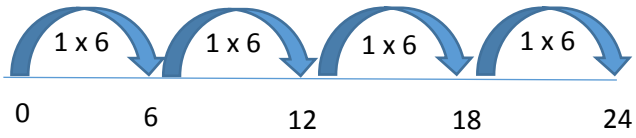
e.g. 563 - 241

	500	60	3	
-	200	40	1	
	300	20	2	= 322

Mental Method 1

Multiplication as repeated addition

e.g. 4 x 6



Mental Method 2

Multiplication by partitioning

e.g. 47 x 6

40 x 6 = 240
7 x 6 = 42

240 + 42 = 282

Pencil and paper procedures for larger calculations

Grid method

72 x 38 is approximately 70 x 40 = 2800

x	70	2
30	2100	60
8	560	16

2100 + 60 = 2160
560 + 16 = 576

Leading to expanded column multiplication

e.g.

30 + 8
x 7

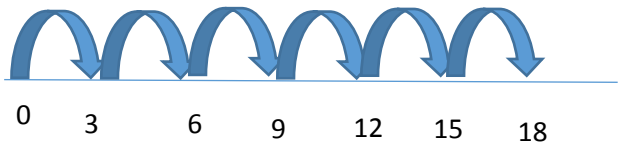
56 (8 x 7 = 56)
210 (30 x 7 = 210)
266

Method 1 (dividing by a single digit)

Understand division as sharing and grouping

e.g. 18 ÷ 3 can be modelled as:

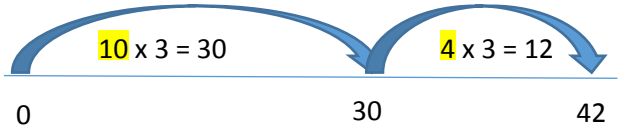
Sharing: 18 shared between 3
OR
Grouping: How many 3's make 18?



Method 2 (dividing by a single digit)

Grouping

e.g. how many groups of 3 go into 42?



42 ÷ 3 = 14

Pencil and paper procedures for dividing by 2 digits

The chunking method

e.g. 213 ÷ 16 Friendly Multiples x10, x5, x2

What should your child be able to do by the end of year 3?

The targets below are key objectives that your child should be able to do by the end of the school year. Therefore, working on one or two of these targets at home can significantly aid your child's learning. However, it is important to understand that all children progress at different rates, and the targets should only be used as a broad guide as they may not be totally representative of your child's stage of development. If you do have any questions about the nature of these targets or indeed the strategies needed to work through them please refer to your child's class teacher.

Year 3 End of Year Objectives

Tick	
☐	Read and write numbers up to 1000 and put them in order.
☐	Know what each digit is worth.
☐	Count on or back in tens or hundreds from any number under 1000, e.g. 462, 472, 482… or 462, 562, 662…
☐	Know by heart addition and subtraction facts to 20, e.g. 4 + 16 = 20, 12 – 8 = 4.
☐	Work out in their heads sums such as 56 + 29, and 97 – 51.
☐	Know by heart the 2, 5 and 10 times tables.
☐	Do simple divisions, such as 27 ÷ 5.
☐	Find simple fractions, such as 1/2, 1/3, 1/4, 1/5, 1/10, of shapes and numbers.
☐	Tell the time to the nearest 5 minutes.
☐	Use £.p. e.g. know that £2.04 is £2 and 4p.
☐	Solve simple number problems and explain how to work them out.
☐	Recognise right angles and lines of symmetry in simple shapes.
	Explain a simple graph.

What else can you do in or out of your home?

Car Journeys

Note the time that you set off and tell your child how long you think it will take to get there. Get them to predict the estimated time of arrival. Also ask them if they can work out the exact time the journey took by finding the difference between the departure and arrival time. During the journey you can ask them to record which was the most popular colour of car they see. Begin to use vocabulary like 'popular', 'common' and then eventually progress to using the 'mode' which is the mathematical term we use in school for the 'most frequent' number.

Counting Ideas

Counting forms an important part of the calculation children have to do every day. With good counting skills, children can add, subtract, multiply and divide.

- Counting on or back in 1s, 10s and 100s from any number
- Counting in regular steps (e.g. 2, 4, 6 etc)

Going Up and Down Your Stairs

Pick a number for the bottom step. Then count in tens or hundreds going up. Counting in hundreds can be done in grams and millimetres as well. Pick a bigger number for the top step and count backwards as you go down the stairs. (For some, this can be done using decimals or even move into negative numbers).

Counting in regular steps going up or down stairs can help with times tables.

- What number will we be on when we reach the 6^{th} step?
- What number is at the top/bottom step?
- How many steps to reach 28 if we count in 4s?
- If we count in 200g steps, when will we reach 1kg?

(Don't worry if you live in a bungalow. You can count the paving slabs on the path).

Sport in the Newspaper or on the Telly and Reading Numbers

Children need to be able to read and write whole numbers going into thousands. They also have to round numbers to the nearest 10, 100 or decimal place. Children also have to be able to read and interpret tables and charts. Newspaper and BBC Sport web pages are a good source of tables and charts. There is also plenty of sport on the telly.

- How many people watched Doncaster play Sheffield Wednesday?
- Where was the biggest crowd in the premiership?
- How many goals were scored in the premiership altogether/before half time/in the second half?
- For cricket fans, how many runs did the top 3 run scorers score? How much did the rest score?
- In darts, a player has 116 left. How will he score this to win with 3 darts?
- Snooker has a whole set of possibilities. After a break of 50, guess how many balls were potted? What is the most or least it could have been?
- In athletics/motor racing/skiing you have to read time to the decimal places. Good for ordering numbers!
- At the Olympics or at the athletics, how much higher and further did someone throw/jump than their nearest rival?

Playing Cards

There are many ways to use playing cards to help children to use their maths skills.

Ordinary Playing Cards

Take out the picture cards. Play snap but you only have a snap if the total of the cards is 10. For older children, the number on the cards stands for how many tens there are in the number. Play snap but you only have a snap if the total of the cards is 100.

You can also play a points game. When 2 cards of the same suit are put down, multiply/add the cards together (depending on their age). If you are correct, you score the number of points in the answer you gave. Choose a target e.g. 100 points. The first past the total is the winner. (This also involves addition and subtraction. How many more do we need to win? Which cards do you think would help?)

Top Trumps

These are great games on their own and can support reading from a chart. They usually have a range of large and small numbers and a range of areas of interest.

- Which superhero is the tallest/strongest etc?
- Which car/bike/plane in the fastest/costs the most?
- Who is the oldest?
- Which do you think is the best card?

Cooking

Cooking gives children practical experience of measuring, fractions and reading from scales. It is also a great activity for allowing children to access the idea of ratios and how ingredients can be added to or reduced depending on the number of people your cooking/baking for.

Using Recipes

Recipes often suggest how many people you can feed or how many items you can make.

- If the recipe is for 8 people, can you make it for 4?
- If the recipe is for 8 biscuits, have we got enough ingredients to make 16?
- Will there be any biscuits/cakes left for you to give to your teacher?
- We need $\frac{1}{4}$ of a kilogram of flour, how many grams is this?
- Tip half the raisins into the bowl, how do you know what half is?

Setting the TV recorder/Using TV Listings

A challenge in its own right!!

- How long is your programme?
- This film is 128 minutes long. When will it finish? Will it be after your bedtime?
- How many episodes of your favourite programme can you record onto a 3 hour DVD?

Out Shopping

Shopping gives children a great chance to use their Maths skills (and to empty their parents' wallets and purses).

Any opportunity to find value for money gives children experience of money and solving problems. When out and about, getting children to handle money and pay at the counter helps children to count in different ways and make totals in a variety of ways.

Shopping gives children the opportunity to spot and name shapes, especially 3-D shapes (e.g. cubes, cylinders, cuboids, spheres, prisms, cones, pyramids etc.).

Things you Might Ask:

- £ How much will we save if we buy 3 for 2?
- £ Is it better to buy 2 individual apples or a bag?
- £ If we buy this item how much change will we get from £5?
- £ How special is a special offer? Do we save much?
- £ For small shopping lists, how much have we spent so far? How much change from £5/£10?
- £ How many weeks will it take to save your pocket money if you want to buy that?
- £ Can you find me a cylinder/cuboid?
- £ How many 10p coins do you need to pay for that?

Websites

Woodlands Junior

This website has lots of games and activities across all areas of maths and is one of the sites we use the most. Kids particularly enjoy playing their version of the TV show 'Countdown' where you can play the traditional numbers and words game that reinforces children's understanding of number and spelling patterns. The interactive times tables section is particularly good for rapid recall of facts and has a competitive element where you can race against others. Many of the activities take you to other websites (some of which we have signposted in the section).

http://www.woodlands-junior.kent.sch.uk/maths/

http://www.woodlands-junior.kent.sch.uk/maths/timestable/interactive.htm

PBS Kids

This site has a range of educational games for children of all ages and has plenty for younger children.

http://pbskids.org/games/alltopics.html

BBC

The BBC website provides a range of Maths activities for children across the primary range. On the page that appears when using the link below, you will find a number of different sites some of which have useful parent support information.

http://www.bbc.co.uk/schools/websites/4_11/site/numeracy.shtml

Education City

Each child at NJS can now use this online learning platform. Within their reading records they have a username and password to enable them to access the website and there's a range of materials that have been tailored to the new National Curriculum.

http://www.educationcity.com/

Other Good Games to Play

- *Uno* – good game for recognising and matching numbers
- *Dominoes* – supports counting and associating patterns with numbers
- *Snakes and Ladders* – counting numbers up to 100/
- *Scrabble* – adding, multiplying (doubling, trebling) and good for vocabulary development and spelling.
- *Monopoly* – good for handling money, paying using notes, giving change.
- *Yahtzee* – a good game for adding, multiplying and probability.