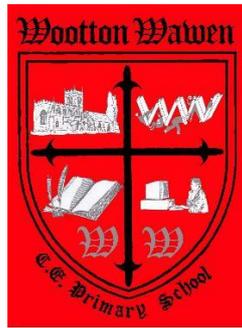


Wootton Wawen C.E. Primary School



A Guide to Mental Maths

Why is it important that children recall maths facts?

“ Calculators should not be used as a substitute for good written and mental arithmetic.”

(National Curriculum 2014.)

Many parents might question why in today's society, with calculators and computers, children need to know addition, subtraction, multiplication and division facts. However, knowing mathematical facts is crucial to your child's progress in mathematics. When a child can quickly retrieve answers from memory without having to rely on counting procedures, such as counting on fingers, they are better equipped to solve more challenging problems.

As your child gets older, much of the work they do in mathematics will require them to use number – fractions, measures and data handling all require children being able to add, subtract, multiply or divide. Mental maths tests are part of the end of Key Stage tests.

Learning number facts is best done with collaboration between the school, child and teacher. In school, we spend a lot of time teaching and practising the strategies for solving mental calculations. However, your child will be more successful at retaining these if they regularly practise at home.

Mental Maths Expectations

The table below sets out the expectations for mental recall of facts for each year group based on the National Curriculum 2014

Year	Addition and Subtraction	Multiplication and Division
EYFS	Says which number is one more or one less than a given number to 20.	
Year 1	Identify one more one less than a given number. Recall number bonds and related subtraction facts to 10 and 20	Count in 2s, 5s and 10s.
Year 2	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: -a two-digit number and ones; -a two-digit number and tens two; -two-digit numbers; -adding three one-digit numbers. Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.	Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward. Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables.
Year 3	Add and subtract numbers mentally, including: -a three-digit number and ones; -a three-digit number and tens; - a three-digit number and hundreds. Solve calculation where the answers could exceed 100.	Count from 0 in multiples of 4, 8, 50 and 100. Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
Year 4	Find 1000 more or less than a given number.	Count in multiples of 6, 7, 9, 25 and 1000. Recall multiplication and division facts for multiplication tables up to 12×12 . Multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. Use multiples of 2, 3, 4, 5, 8, 10, 50 and 100. Extend known facts to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).
Year 5	Add and subtract numbers mentally with increasingly large numbers. Use increasingly large numbers to aid fluency (for example, $12\,462 - 2300 = 10\,162$). They mentally add and subtract tenths, and one-digit whole numbers and tenths.	Multiply and divide numbers mentally drawing upon known facts
Year 6	Perform mental calculations, including with mixed operations and large numbers.	They undertake mental calculations with increasingly large numbers and more complex calculations.

Passports

At school we have a Maths Passport challenge. Each continent visited by your child has between four and six number facts that have to be learned. Once each continent is visited your child becomes a Globetrotter and can collect six Globetrotter certificates.

Number facts are tested on three separate occasions. The “testing” involves your child being asked three or four questions linked to the target and responding correctly within three seconds. It may be best for your child to work on one or two targets at a time. As your child moves to a new continent a letter will be sent home with their new targets.

At the back of this guide is a list of the targets for each passport.

Vocabulary

Below is a list of some of the vocabulary the children may use while learning and applying number facts.

Addition and Subtraction

add, addition, more, plus, increase, sum, total, altogether, score, double, near double, how many more to make...?, subtract, 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...?, is the same as, equals, sign, tens boundary, hundreds boundary, units boundary, tenths boundary, inverse.

Multiplication and Division

lots of, groups of, times, product, multiply, multiplied by, multiple of, once, twice, three times, four times, five times,... ten times, repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each..., group in pairs, threes... tens, equal groups of, divide, divided by, divided into, divisible by, remainder, factor, quotient, inverse

Learning number facts

The key to learning number facts is frequent, regular repetition. It is best to spend 5 to 10 minutes a day rather than a one hour block every week. Below are some ideas of how you can support:

- Have a 'fact of the day'. Pin this fact up around the house. Practise reading it in a quiet, loud, squeaky voice. Ask your child over the day if they can recall the fact.
- Play 'ping pong' to practise complements with your child. You say a number. They reply with how much more is needed to make 10. You can also play this game with numbers totalling 20, 100 or 1000. Encourage your child to answer quickly, without counting or using fingers.
- Test and time. Give your child 20 questions to solve. Time how long it takes. Can they beat their time the next day?
- Use flash cards. Create flash cards with number fact questions for them to solve.
- Throw 2 dice. Ask your child to find the total of the numbers (+), the difference between them (-) or the product (x). Can they do this without counting? Use a set of playing cards (no pictures). Turn over two cards ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in 2 minutes?
- Play Bingo. Each player chooses five answers (e.g. numbers to 10 to practise simple addition, multiples of 5 to practise the five times tables). Ask a question and if a player has the answer, they can cross it off. The winner is the first player to cross off all their answers.
- Give your child an answer. Ask them to write as many addition sentences as they can with this answer (e.g. $10 = \square + \square$). Try with multiplication, division or subtraction.
- Give your child a number fact (e.g. $5+3=8$). Ask them what else they can find out from this fact (e.g. $3+5=8$, $8-5=3$, $8-3=5$, $50+30=80$, $500+300=800$, $5+4=9$, $15+3=18$). Add to the list over the next few days. Try starting with a multiplication fact as well.

Top Tips for Learning Tables

- The first thing to remember is when we multiply two numbers, it does not matter which is first or second, the answer is always the same. For example, 4×5 and 5×4 are both 20 so they only need to learn these once.
- Make sure your child realizes that any number times zero equals zero and any number times one equals that number.
- The 2x table is just doubling the number.
- To multiply by 3 get your child to think about what 2 times a number is and add on. For example for 3×6 think about $2 \times 6 = 12$ plus 6 more equals 18.
- When multiplying by 4 just double and double. For example for 4×7 think $2 \times 7 = 14$ + $14 = 28$
- The 5x table has a pattern: 5, 10, 15, 20, etc. It ends in either **0** or **5**.
- The 6x table is double the 3x table. So 4×6 is $4 \times 3 = 12$ and then double to 24.
- The 8x table is double, double, double. Eg $4 \times 8 =$ double $4 = 8$, double $8 = 16$, double 16 is 32.
- The 9x tables has a pattern the "units" place goes down: 9,8,7,6, ...? And at the same time, the "tens" place goes up: 1,2,3,...?
Demonstrate the 9's trick and encourage using it until 9's multiplication facts are memorized. For the 9's trick you place both hand, palms down, on a flat surface. If the fact is 9×7 , you start with your pinky finger on your left hand as finger number 1 and count to your 7th finger which would be your pointer finger on your right. You put that finger down. There are 6 fingers up to the left of the one that is down and 3 fingers up to the right of the one that is down. This is a visual representation for 63 which is the answer to 9×7 .
- 10x table is easy. All the unit digits end in zero.
- $11 \times$ is **mostly easy**: from 11×2 to 11×9 you just put the two digits together. $11 \times 2 = 22$, $11 \times 3 = 33$, ..., $11 \times 9 = 99$.
- For 12x table remember to use 10x and 2x table. For 12×8 just find $10 \times 8 = 80$ and $2 \times 8 = 16$ and add together to give 96.

Finally, try these rhymes to help learn the really tricky facts:

- $6 \times 7 = 42$. Use this rhyme to help memorize this tricky multiplication fact:
"Multiplication is easy 4 me 2 do. $6 \times 7 = 42$."
- Teach $6 \times 8 = 48$. "6 and 8 went on a date. They came back as 48."
- Teach $7 \times 8 = 56$. Refer to this tricky multiplication fact as the dance step because before you start dancing you say "5, 6, 7, 8," all of these numbers appear in this fact.
- Teach $8 \times 8 = 64$. "I ate and I ate and got sick on the floor. $8 \times 8 = 64$."

Resources

On-line and published resources are useful for consolidating number facts and increasing the speed of recall. There are many free games available on the Internet. Just use the search engine to discover them. The Resources section of the Portal also has a great selection of games you can use.

Some recommended web sites are:

<http://www.mathsisfun.com/> - this has a great quiz you can do each day and has been recommended by some of the children at our school.

<http://www.multiplication.com/>

<http://www.coolmath-games.com/>

Some web sites will generate worksheets that you can print off for your child.

<http://www.timestables.me.uk>

<http://www.math-aids.com/>

There are also plenty of books you can buy.

1	Europe
1.1	Say the numbers 0 to 10 accurately
1.2	Say the numbers 0 to 20 accurately
1.3	Say 1 more than any number between 0 -10
1.4	Say 1 less than any number between 0 -10
2	Asia
2.1	Count in 2s to at least 50
2.2	Count in 5s to at least 100
2.3	Counts in 10s to at least 200
2.4	Know by heart all number bonds up to 10
2.5	Recall the doubles of all numbers to at least 10
3a	North Africa
3a.1	Know by heart all number bonds that total 20
3a.2	Know by heart doubles of all numbers up to 20
3a.3	Know by heart all halves of numbers up to 20
3a.4	Know by heart all multiplication facts for 2 up to 2 x 12
3a.5	Know by heart all multiplication facts for 10 up to 10 x 12
3a.6	Know what is meant by odd and even numbers and can recognise them up to 100
3b	South Africa
3b.1	Know by heart all bonds of multiples of 10 up to 100
3b.2	Know by heart all division facts for 2 up to 20
3b.3	Know by heart all multiplication facts for 5 up to 5 x 12
3b.4	Know by heart all division facts for 5 up to 60
3b.5	Know by heart all division facts for 10 up to 120
3b.6	Can round 2 digit numbers to the nearest 10
4a	North Australia
4a.1	Know by heart all sums and difference of multiples of 10 up to 100
4a.2	Know by heart all multiplication facts for 3 up to 3 x 12
4a.3	Know by heart all multiplication facts for 4 up to 4 x 12
4a.4	Know by heart all multiplication facts for 6 up to 6 x 12
4a.5	Know by heart all multiplication facts for 8 up to 8 x 12
4a.6	Recognise multiples of 2, 5, 10 up to 1000
4b	South Australia
4b.1	Know by heart all number bonds that total 100
4b.2	Know by heart all division facts for 3 up to 36
4b.3	Know by heart all division facts for 4 up to 48
4b.4	Know by heart all division facts for 6 up to 72
4b.5	Know by heart all division facts for 8 up to 96
4b.6	Know what is meant by the signs < and > and use them to compare numbers
5	North America
5.1	Double any 2 digit number
5.2	Halve any 2 digit number
5.3	Know by heart all multiplication facts for 7 up to 7 x 12
5.4	Know by heart all division facts for 7 up to 84
5.5	Know by heart all multiplication facts for 9 up to 9 x 12
5.6	Know by heart all division facts for 9 up to 108
6	South America
6.1	Double any number with up to 1 decimal place
6.2	Halve any number with up to 1 decimal place

6.3	Recall quickly multiplication facts up to 12 x 12 and use them to multiply pairs of multiples of 10 and 100 e.g. 30 x 70, 40 x 200
6.4	Know the factors of all times tables answers up to 12 x 12
7	Globetrotters
7.1	Know by heart all the squares of numbers between 1 and 12
7.2	Know by heart all squares of multiples of 10
7.3	Recognise and recall factors of numbers up to 100 and corresponding multiples of 100
8	Globetrotters 2
8.5	Add any two 2-digit numbers (eg. 23+48)
8.6	Subtract any 2-digit number from a multiple of 10 (eg. 60-43)
9	Globetrotters 3
9.1	Add any two numbers with up to 1 decimal place (eg. 5.6 and 7.8)
9.2	Subtract any two 2-digit number (eg. 62-43)
9.3	Multiply numbers with up to 2 decimal places by 10 and 100 (Eg. 5.8x10 or 2.76x100)
9.4	Recall quickly division facts for all tables to 12x12 and use them to divide multiples of 10 and 100 (e.g. 240 ÷ 60)
9.5	Recall quickly division facts for all tables to 12x12 and use them to give remainders as whole numbers (e.g. 24 ÷ 5 = 4 r 4)
10	Globetrotters 4
10.1	Add pairs of numbers with 2 significant numbers (eg. 3.4+3.8 or 3400+3800)
10.2	Give change from any whole pound (eg. £3.00-£1.57)
10.3	Use double-double or partitioning to multiply any 2-digit number by 4 (eg. 34x4=136)
10.4	Use multiply by 10 and halve or partitioning to multiply any 2-digit number by 5 (eg. 46x5=230)
10.5	Halve even amounts of money (eg. £ 3.52 ÷ 2=£1.76)
11	Globetrotters 5
11.1	Add negative numbers in a context such as temperature/money (eg. -14+6 or -12+-4)
11.2	Subtract negative numbers in a context such as temperature/money
11.3	Subtract any two numbers with up to 1 decimal place (eg. 9.6 -4.8)
11.4	Give equivalent fractions (eg. 3/4 is the same as ?/16)
11.5	Reduce fractions to their simplest form
12	Globetrotters 6
12.1	Add pairs of 3-digit numbers (eg. 453+654)
12.2	Subtract any 2-digit number from a 3 or 4-digit number (eg. 453-64)
12.3	Find non-unit fraction values of whole numbers (eg. 3 / 5 of 30)
12.4	Find % values of whole numbers that are multiples of 10 or 5 (eg. 40% of 80 or 15% of 60)