Mathematics Parents Information Evening EYFS – Year 4

The Mastering Number Programme



Multiplication Tables

MTC &





The Mastering Number Programme NO MORE COUNTING IN ONES!

- This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2.
- The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number.
- Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.
- Research shows that children with secure 'number sense' early on will make more progress later on in Maths and across the curriculum.



The Mastering Number Programme REPRESENATIONS & RESOURCES







Finger Pattern



Tens Frame

Rekenrek



Numberblocks

Hungarian Number Pattern





The Mastering Number Programme

KEY ASPECTS

- Cardinality
- Subitising
- Composition of Number
- Comparison
- Number Facts & Arithmetic







The Mastering Number Programme CARDINALITY

Understanding that the cardinal value of a number refers to the quantity, or 'howmanyness' of things it represents.

The cardinal value of a number refers to the quantity of things it represents, e.g. the numerosity, 'howmanyness', or 'threeness' of three.

When children understand the cardinality of numbers, they know what the numbers mean in terms of knowing how many things they refer to.

Counting is one way of establishing how many things are in a group, because the last number you say tells you how many there are. Children enjoy learning the sequence of counting numbers long before they understand the cardinal values of the numbers.

A lack of understanding of cardinality can easily be hidden by a routine that a child has learned to perform without understanding the mathematics. Skilled Early Years, Reception and KS1 teachers are able to spot this, and also to teach using methods that will expose the structure for children and help them to deeply understand it.





The Mastering Number Programme SUBITISING

Subitising is the ability to instantly recognise the number of objects in a small group without the need to count them.

Subitising is recognising how many things are in a group without having to count them one by one.

Children need opportunities to see regular arrangements of small quantities, e.g. a dice face, structured manipulatives, etc., and be encouraged to say the quantity represented.

Children also need opportunities to recognise small amounts (up to five) when they are not in the 'regular' arrangement, e.g. small handfuls of objects.





The Mastering Number Programme COMPOSITION OF NUMBER

Understanding that one number can be made up from (composed from) two or more smaller numbers.

Knowing numbers are made up of two or more other smaller numbers involves 'part—whole' understanding.

Learning to 'see' a whole number and its parts at the same time is a key development in children's number understanding.

Partitioning numbers into other numbers and putting them back together again underpins understanding of addition and subtraction as inverse operations.





The Mastering Number Programme COMPARISON

Understanding that comparing numbers involves knowing which numbers are worth more or less than each other.

Comparing numbers involves knowing which numbers are worth more or less than each other.

This depends both on understanding cardinal values of numbers and also knowing that the later counting numbers are worth more (because the next number is always one more).

This understanding underpins the mental number line which children will develop later, which represents the relative value of numbers, i.e. how much bigger or smaller they are than each other.





The Mastering Number Programme NUMBER FACTS & ARITHMETIC

Basic number combinations for addition, subtraction, multiplication, and division are known as number facts. Children should be able to recall these within a few seconds, with no working out. (KIRFs)

Number facts are sometimes referred to as **number bonds** (addition and subtraction) and **times tables with related division facts** (multiplication and division).

Number sense is developed by math fact fluency. Children who have a strong sense of numbers will have a better understanding of how numbers relate to one another.

Complex mathematical concepts are built on math facts foundation. A child will come across a number of concepts fairly early in their learning process, including long multiplication and division, measurement, time telling, counting money, and adding and subtracting larger numbers. Children who spend a lot of time working on the fundamentals are more likely to struggle with the procedures and become lost in their calculations.





The Mastering Number Programme at DSJ







Times Tables are at the heart of mental arithmetic, which in itself helps form the basis of a child's understanding and ability when working with number.

Once the children have learnt the times tables and related divisions by heart, they are able to work far more confidently – and efficiently – through a wide range of more advanced calculations.

At Deeping St James Community Primary School, we believe that through a variety of interactive, visual, engaging and rote learning techniques, most children can achieve the full times tables knowledge required by the end of Year 4.





Year Group Expectations



End of Year Expectations:

- Year 2 (Blue)–
 recall of 2, 5 and
 10s
- Year 3 (Green) recall of 3, 4 and
 8s
- Year 4 (Red) –
 recall of 6, 7, 9,
 11 and 12s

NCETM
NATIONAL CENTRE FOR EXCELLENCE
IN THE TEACHING OF MATHEMATICS

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144





MTC (Multiplication Tables Check)



Purpose

To determine whether Year 4 pupils can fluently recall their multiplication tables. Fluency is the main focus.

Timescale

The MTC assessment will be taken by pupils at the end of Year 4 – schools will be given a 3 week window in June each year in which this assessment needs to be completed for all pupils.

Assessment Format

The MTC will be administered as an online, on screen assessment. The assessment will consist of multiple, equivalent forms and one form will be assigned randomly to each pupil as they log on. This means all pupils will have different questions to their peers. Each form will consist of 25 multiplication questions and they will follow this format: $n1 \times n2 =$







Time Limits

MTC (Multiplication Tables Check)



The pupils will get a total of 6 seconds to enter a response for each question. Pupils will be inputting their response in school using a touchscreen device and the on-screen number pad.

Practise of using this technique on

https://www.timestables.co.uk/multiplication-tables-check/

When the time expires the online form will automatically move onto the next question. The MTC will take less than 5 minutes for each pupil to complete.

Content

Questions will be selected from the 121 numbers that make up the 2 to 12 multiplication tables. The ones multiplication, as well as the zeros, will not be included.

There will be an emphasis on the 6,7,8,9 and 12 multiplication tables as these have been determined to be the most difficult, with some questions from the 3,4,5 and 11xs. There will only be a maximum of 2/25 questions form the 2 or 10xs table as these are deemed to be the easiest.







Why are tables so important?



	Algebra
Year 6 Objective Map - New Curriculum	use simple formulae
	generate and describe linear num
Numbers and Place Value	express missing number problems
read, write, order and compare numbers up to	find pairs of numbers that satisf
10 000 000 and determine the value of each digit	enumerate possibilities of combin
round any whole number to a required degree of accuracy	Multiplication, Division, Addition
use negative numbers in context, and calculate intervals across zero	multiply multi-digit numbers up to
solve number and practical problems that involve all of the above.	multiplication
Fractions and Decimals and Percentages	interpret remainders as whole nu
use common factors to simplify fractions; use common multiples to express fractions in the same denomination	divide numbers up to 4 digits by a
compare and order fractions, including fractions > 1	appropriate, interpreting remaine
add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent	perform mental calculations, inclu
fractions	identify common factors, common
multiply simple pairs of proper fractions, writing the answer in its simplest form	use their knowledge of the order
divide proper fractions by whole numbers	solve addition and subtraction mu
associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple	why solve problems involving addition
fraction	use estimation to check answers
identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10,	of accuracy.
100 and 1000 giving answers up to three decimal places	Geometry
Ratio and proportion	draw 2-D shapes using given dime
solve problems involving the relative sizes of two quantities where missing values can be found by using integer	recognise, describe and build sim
multiplication and division facts	compare and classify geometric s
solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and	triangles, quadrilaterals, and regu
the use of percentages for comparison	illustrate and name parts of circl
solve problems involving similar shapes where the scale factor is known or can be found	recognise angles where they mee
solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	angles.

use simple formulae					
generate and describe linear number sequences					
express missing number problems algebraically					
find pairs of numbers that satisfy an equation with two unknowns					
enumerate possibilities of combinations of two variables.					
Multiplication, Division, Addition and Subtraction.					
multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long					
multiplication					
divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and					
interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context					
divide numbers up to 4 digits by a two-digit number using the formal written method of short division where					
appropriate, interpreting remainders according to the context					
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 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.					
Geometry					
draw 2-D shapes using given dimensions and angles					
recognise, describe and build simple 3-D shapes, including making nets					
compare and classify geometric shapes based on their properties and sizes and find unknown angles in any					
triangles, quadrilaterals, and regular polygons					
illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is					
twice the radius					
recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing					
angles.					
describe positions on the full coordinate grid (all four quadrants)					
draw and translate simple shapes on the coordinate plane, and reflect them in the axes.					

	Neasurement					
solve problems involving the calculation and conversion of units of measure, using decimal notation up to three						
decimal places where appropriate						
use, read, write and convert between standard units, converting measurements of length, mass, volume and time						
from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal						
P	places					
convert between miles and kilometres						
recognise that shapes with the same areas can have different perimeters and vice versa						
recognise when it is possible to use formulae for area and volume of shapes						
calculate the area of parallelograms and triangles						
calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres						
(cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].						
Statistics						
interpret and construct pie charts and line graphs and use these to solve problems						
calculate and interpret the mean as an average.						



Many Year 6 questions rely on recall of multiplication and related division facts. Year 6 Example Arithmetic Questions

30 × 40 =	$6^2 + 10 =$	$1\frac{1}{2} \times 57 =$	15% × 1,000 =
0.5 × 28 =	$9^2 - 36 \div 9 =$	$\frac{3}{4}$ of 1,000 =	45% of 460 =
3.9 × 30 =	$\frac{5}{7} + \frac{3}{21} =$	785	4 7 8 1 × 2 3
270 ÷ 3 =	$\frac{4}{5} \div 4 =$	× 2 3	
5,400 ÷ 9 =	$\frac{4}{6} \times \frac{3}{5} =$	1 7 7 1 4	592242





Year 6 Reasoning & Problem Solving Example questions linking to x and ÷

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.





A supermarket sells 40 boxes of melons.

How many melons does the supermarket sell?



Learning At School



At DSJ we adopt a variety of approaches to support the children to learn these facts. Using a of variety Visual, Auditory & Kinaesthetic approaches. Whole School Sessions/Maths Curriculum Time

- Activate Times Tables
- Counting Stick Method
- Quick Fire Recall games Bingo
- iPads interactive games/songs

Opportunities at Break/Lunchtime

- Interactive sports game playground wooden plaques
- Visual multiplication grid in dinner hall







Learning At Home Parent/School Partnership



From Year 2 onwards recall of multiplication and division facts is the key learning required at home for mathematics.

Incentives in School

- Working towards their Bronze, Silver, Gold and Platinum Badges
- Learning Behaviour Stamps for progress towards badges (Determined Self Improver/Persistent Problem Solver/ Resilient Risk Taker/Co-operative Group Worker)

Accountability in School

• Weekly Multiplication and Division Tests on child's current badge





Learning At Home Parent/School Partnership



Not all children learn in the same way...

One child may learn multiplication facts very easily with verbal or written drill and repetition. Another child, however, will need something more than this and you may need to look at more creative ways of learning these crucial facts.

Let's take a look ...









Verbal/Written Drills or Repetition

• There are many free games on websites in which you can play repetition games.

See QR Code Sheet to take away'

• You will also find printable sheets for written drills if this is the best way that your child learns — there are many on the school website.

DSJ School Website – Mathematics Page





Creative Ways To Learn Multiplication Facts



Playing Cards



Dice



Lego Bricks

Dominoes









Playdough



Use Dozen Egg Boxes Make your own question generator



Lollysticks – Kaboom







Support/Ideas For Parents





Multiplication with NERF





Schoolhouse Rock! - Multiplication Rock! Multiplication Mash Up and many more!



Slime!







Make Your Own Flashcards





Finger Aerobics for the Nines

















Verbal 'Tables' Tennis **Family Relay**

Adapt this idea to lots of sports



In Retail





**PLEASE NOTE **These are not required in order to support your child. They have been included for parents who wish for some suitable – good quality products.







Thank you for attending this meeting



