CONCRETE · PICTORIAL · ABSTRACT

Measham C of E Primary School

Calculation Guide

Multiplication

A guide for parents and carers on the methods used in school

Rationale

Mathematics is all around us; it underpins much of our daily lives and our futures as individuals and collectively. As the Secretary of State for Education said last year:

'... mathematical understanding is critical to our children's future. Our economic future depends on stimulating innovation, developing technological breakthroughs, making connections between scientific disciplines. And none of that is possible without ensuring more and more of our young people are mathematically literate and mathematically confident. Mathematical understanding underpins science and engineering, and it is the foundation of technological and economic progress. As information technology, computer science, modelling and simulation become integral to an ever-increasing group of industries, the importance of maths grows and grows.'[1]

It is therefore of fundamental importance to ensure that children have the best possible grounding in mathematics during their primary years.
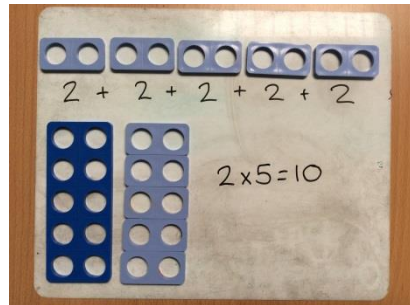
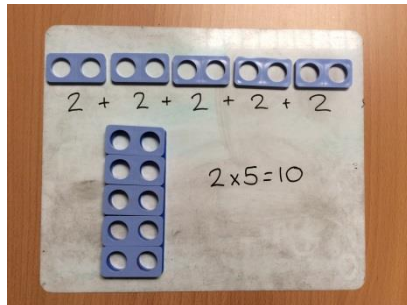I can use Numicon to show repeated addition.

e.g. 2+2+2+2+2 = 10

so 2x5=10

5 lots of 2 = 10
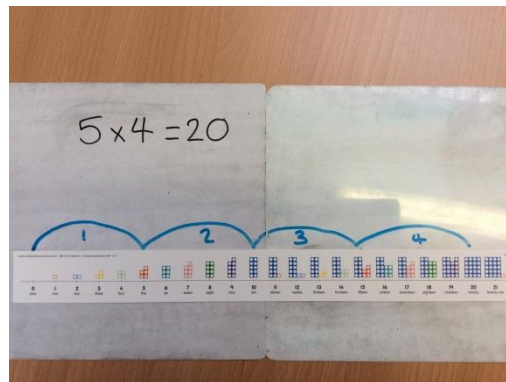

I can use the number line to jump forwards to show lots of.
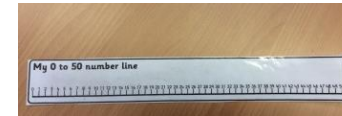
e.g 5+5+5+5 = 20

so 5x4=20

4 lots of 5 = 20

Mental Strategies

- I can count on and back, in steps of 2,5 and 10.
- I can memorise numbers in the 2,5 and 10 times table.
- I can understand terms of half and double.

Equipment

Key Vocabulary

Ones, groups of, lots of, doubling, repeated addition, times, columns, rows, longer, bigger, higher etc.
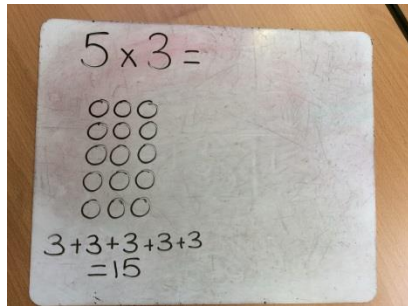
Example of Key Questions

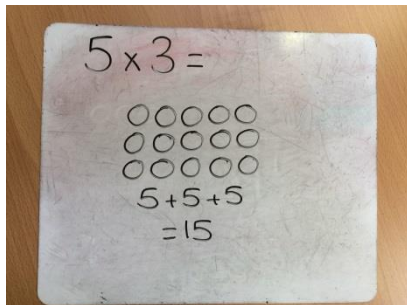Captain Conjecture says, 'I can double any number, but I can only halve some numbers'.
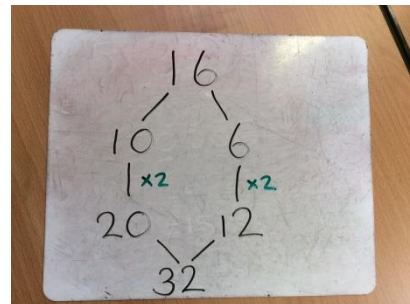
Do you agree?

Explain your reasoning.

Year 2

I can use arrays to help me solve multiplication questions.

$5 \times 3 =$
ooo
ooo
ooo
ooo
ooo
$3+3+3+3+3$
$=15$

I can show my arrays in both ways as I understand that they will get the same answer

$5 \times 3 =$
ooooo
ooooo
ooooo
$5+5+5$
$=15$

I can use jottings to show doubling of 2 digit numbers.

.

16
10   6
|x2 |x2
20   12
32

Equipment

Key Vocabulary

Multiple, multiplication array, multiplication tables/facts, groups of, lots of, times, columns, rows

Example of Key Questions

Which has the most biscuits:
4 packets of biscuits with 5 in each packet, or 3 packets of biscuits with 10 in each packet?

Explain your reasoning.

Year 3

I can use arrays under column headers to help me multiply 1 digit by 2 digit numbers.
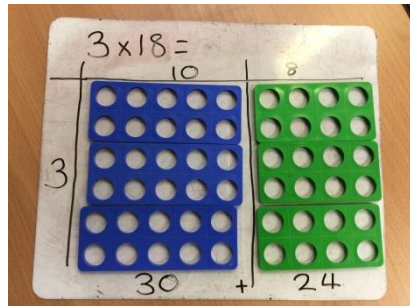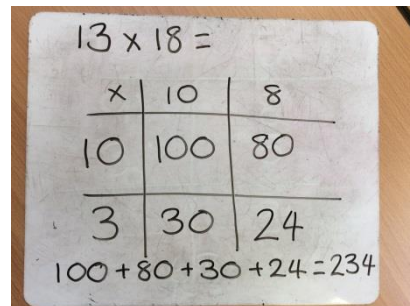
I can use Numicon to help.

I can use the grid method to show multiplication.

Mental Strategies

- I can count on and back, in steps of 4,8,50 and 100.
- I can practise my times table facts
- I can use jottings to help support my thinking
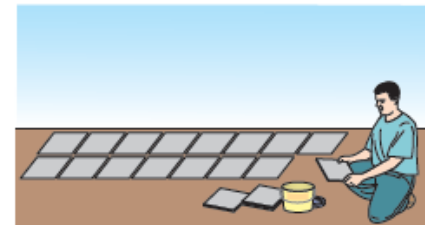- I can double 2 digit numbers using partitioning

Equipment

Key Vocabulary

Multiple, multiplication array, multiplication tables/facts, groups of, lots of, times, columns, rows, partition, grid method, inverse

Example of Key Questions
Roger has 96 patio slabs.
Using all of the slabs find three different ways that he can arrange the slabs to form a rectangular patio.

Year 4

$3 \times 18 =$

	10	8
3	30	24

$30 + 24 = 54$

I can use the grid method to multiply 2 digit by 2 digit numbers

I can solve equations with missing numbers using the grid method.

X	5
10	100
	10

$? \times ? = 180$

find the factors of 64

39   8   7   3

1   32   4   12

Numbers that divide exactly in to 64.

I can begin to understand factors of numbers

Equipment

Key Vocabulary

Multiple, multiplication array, multiplication tables/facts, groups of, lots of, times, columns, rows, partition, grid method, inverse, factor, product

Example of Key Questions

True or false?

$7 \times 6 = 7 \times 3 \times 2$
$7 \times 6 = 7 \times 3 \times 2$

Explain your reasoning.

Can you write the number 30 as the product of 3 numbers?

Year 5

I can use the grid method to multiply up to 4 digit by 2 digit

When I am secure with the grid method, I can begin to multiply using short multiplication.

I can remember to add the 0 when multiplying by the tens.

Mental Strategies

- I can x by 10, 100, 1000 using moving digits
- I can identify factor pairs for numbers
- I can solve practical problems where I can scale up
- I can recall prime numbers up to 19

Equipment

Key Vocabulary

Multiple, multiplication array, multiplication tables/facts, groups of, lots of, times, columns, rows, partition, grid method, inverse, factor, cube numbers, prime numbers, square numbers, common factors, prime factors, composite numbers.

Example of Key Questions

A 5p coin has a thickness of 1.7mm. Ahmed makes a tower of 5p coins worth 50p.

Write down the calculation you would use to find the height of the tower

Year 6

I can multiply up to 4 digit by 2 digit using the short multiplication method.

I can remember to add the 0 when multiplying by the tens.

I can multiply decimal numbers using the short multiplication method.

I can deepen my understanding of multiplication by solving word problems

Miriam and Alan each buy 12 tins of tomatoes. Miriam buys 3 packs each containing 4 tins. A pack of 4 costs £1·40 . Alan buys 2 packs each containing 6 cans. A pack of 6 costs £1·90 .
Who gets the most change from a £5 note?

Mental Strategies

- I can investigate order of operations using BODMAS e.g. Brackets, Operations, Division, Multiplication, Addition and Subtraction

Equipment

Key Vocabulary

Multiple, multiplication array, multiplication tables/facts, groups of, lots of, times, columns, rows, partition, grid method, inverse, factor, cube numbers, prime numbers, square numbers, common factors, prime factors, composite numbers, common factor

Example of Key Questions

Which calculation is the odd one out?
753 × 1·8
(75·3 × 3) × 6
753 + 753 ÷ 5 × 4
7·53 × 1800
753 × 2 – 753 × 0·2
750 × 1·8 + 3 × 1·8

Explain your reasoning