## WELCOME

KS1 Parents Workshop for Mathematics 2017

## Aims

- New curriculum for mathematics at KS 1
- Mental calculation strategies in KS1
- Use \& application of mathematics in KSI
- Homework
- Share some ideas of how you can help your child
- WHAT MAKES A GOOD MATHEMATICIAN
?

Number facts
Use \& apply skills and knowledge
Conceptual understanding
Generalise \& find patterns
Perseverance
Risk-takers
Challenge
Vocabulary
Think mathematically
Problem solvers
Estimate
Fluent calculators
Reasoning

- Higher expectations overall benchmarked against other nations
- Conceptual development of number addressed in more detail
- Fewer things in more depth
- All pupils expected to build firm foundations to help become KS2 and KS3 ready


## Primary Mathematics - What has Changed?

## Aims - fluency

- National Curriculum for Mathematics become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.


## Reason Mathematically

o reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

## Solve Problems

- can solve problems by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.


## Key Stage 1 Practise makes Permanent

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (for example, concrete objects and measuring tools). An emphasis on practice at this early stage will aid fluency.
DfE, 2013

## Progression - Number \& Place Value

## Year 1

count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens read and write numbers from 1 to 20 in numerals and words.
read, write and interpret mathematical statements involving
addition (+), subtraction (-) and equals (=) signs
recognise, find and name a half \& a quarter as one of two equal parts or 1 of 4 equal parts of an object, shape or quantity

## Year 2

count in steps of 2,3 , and 5 from 0 , and in tens from any number forward or backward compare and order numbers
from 0 up to 100; use <, > and = signs
identify, represent and estimate numbers using different representations,
including the number line recognise the place value of each digit in a two-digit number (tens, ones)
use place value and number facts to solve problems

## Progression - Addition \& Subtraction

## Year 1

- read, write and interpret
- mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20 , including zero
- solve one-step problems that involve addition and subtraction,
- using concrete objects and pictorial representations, and missing number problems such as $7=$ ? -9


## Year 2

- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subłract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones


## Progression - Multiplication \& Division

## Year 2

- recall and use multiplication and division facts for the 2,5 and 10


## Year 1

- solve one-step problems involving
- multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
- multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division $(\div)$ and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including
- problems in contexts.


## Progression - FRACTIONS Year 1 \& 2

## Year 1

- recognise, find and name a half as one of two equal parts of an object, shape or quantity
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

Year 2

- recognise, find, name and write fractions $1 / 3$, . , 2/4, 3/4 of a length, shape, set of objects or quantity
- write simple fractions for example, $1 / 2$ of 6 = 3 and recognise the equivalence of $2 / 4$ and half


## Addition \& Subtraction Calculation Strategies

Models \& Representations

## Calculation Strategies Counting on and Back (without partitioning)

- Count on or back in ones
- Counting on and back
- Complimentary Addition (finding a difference) often used for subtraction -count up in ones from the smallest to the bigges $\dagger$



## Calculation Strategies

Counting on and Back (with partitioning)Calculation Strategies Counting on and Back (with partitioning)

- Counting on and back
count on or back bv $76+35$ :

$54-28:$

- Complimentary Addition (find a difference)
$85-37$
- by counting up from 37 to 85 (the shopkeeper's method):



## Your Turn...

- Use counting on/back or complimentary
o addition. Show me on your whiteboards.
- $14+22$ =
- $47-32$ =
- How could you check?


## Calculation Strategies <br> Partitioning

- Requires a secure understanding of place value
- $26+32=$
- $20+6+30+2=$
- $6+2=8$
- $20+30=50$
- $8+50=58$


## Calculation Strategies Bridging

- Knowing how close a number is to the next or previous multiple of 10 .
- $16+7=$
- $16+4+3=23$



## Calculation Strategies Compensation

- Good for adding or subtracting numbers close to a multiple of 10, such as numbers that end in 1, 2, 8 or 9
- $36+28=$
- 36 +
- $30-2=64$



## Calculation Strategies Number lines \& Time

- The time is 10:36am. How long will it be until 11:15am?



# Multiplication \& Division Calculation Strategies 

Models \& Representations

## Multiplication \& Division Strategies

- Number facts and multiplication tables should be learnt 'by heart'. Resorting to a basic counting strategy can distract learners from thinking about the calculation strategy they are trying to use.
- Division and multiplication are inverse operations. They should also be able to recall quickly the corresponding division facts.


## Multiplication \& Division Strategies

- Skip counting $5 \times 4=$ as 5, 10, 15, 20

Repeated addition. Uses a combination of known multiplication facts and repeated addition
$4 \times 6$ as $(6+6)+(6+6)=12+12=24$.

- uses known multiplication facts and repeated addition facts to calculate division
$20 \div 4=5$ because $5+5=10$ and $10+10=20$


## Representations of multiplication

- Use the counters to represent


## 12

## Representations of multiplication

- Multiplication represented as an array. How



## Multiplication \& Division Strategies

- Use known facts derive answers to multiplication and division problems

$$
4 \times 8=2 \times 16=32
$$

(doubling and halving)
$9 \times 6$ is $(10 \times 6)-6=54$
(rounding and compensating)
$63 \div 7=9$ because $9 \times 7=63$
(reversibility)

## Multiplication \& Division Strategies

- Partitioning
$24 \times 6=$
$20 \times 6+4 \times 6=$
- Rounding and compensating
$24 \times 6=$
$25 \times 6-6$


## Your Turn...

- Use partitioning or rounding and compensating
$19 \times 5=$


## How is mathematical learning

 achieved in KS 1?-     - Daily lessons
-     - Daily practice
-     - Whole class
-     - Small focus groups

-     - Concrete to abstract


## Conceptual Understanding \& Big Ideas

- Addition \& Subtraction
- Equals
- Multiplication \& Division
- Place Value
- The use and understanding of the language
- Reasoning
- Prove IT!

How can you help your child with mathematics?

## Number and Calculation

- Number lines: jumping forwards and backwards
- 0-99 grid: 1 more/less \& 10 more/less
- Using number facts: doubles \& near doubles/ number bonds to 10 etc.
- Encourage the most efficient strategy
- Place value: How do you know 65 is larger that 56?


## Number Facts and Times Tables

- Use songs and actions
- Count in multiples before using the times table facts 0, 3, 6, 9, 12
- Learn tables out of sequence and related division
- Facts,
- Practical activities to encourage use and application of times tables i.e. setting the table, pairs of socks, shoes, packets of biscuits etc.
- Number cards - learn inverse, use unknown number i.e. $3+$ ? $=4$


## THANK YOU

I hope you enjoyed and learned from today's workshop - please complete an evaluation sheet.

