## Welcome to our Maths Information Workshop for Parents

How maths is taught today... What are all those strange bits of equipment? How you can help...

## Have a go at some of our activities whilst you are waiting!



## Lower Key Stage 2

Years 3 and 4

March 2019

## Quick warm up...



## Select some cards...

What numbers can you make with these cards when you put them in a number sentence?

Examples...

$$
\begin{array}{rlrl}
10-8 & =2 & 8 \div 2 & =4 \\
10-1 \times 2 & =18 & 10 \times 8 \times 2 & =160
\end{array}
$$

## Can you think of a job or everyday task where maths is not used in some way?


fra te ore no wits
$\underset{\text { gaming in }}{\text { gam }} \because$
your way forward.

 anis about maths Deciding werisst of whole

 wringing scale measures

maths

careers

## Institute of

mathematics

## How do you feel about maths?

Maths

## Wich of these words would you use to describe mathematics?




Maths

Maths today is a bit different to how some of us might remember being taught it!


## Why we do things differently...

## Maths

$$
\text { 1. Write }<\text { or }>\text {. }
$$

$$
\begin{aligned}
& \text { a. } 0.5 \frac{\partial r}{\partial r} 1.0 \\
& \text { b. } 3.2 \frac{1.02}{r}
\end{aligned}
$$

$$
\text { c. } 4.83
$$

or
 4.8
d. 6.25

e. 0.7


Q: What's the difference between 9 and 4?

Child's answer: The 9 is curvy and the 4 is all straight!

## Math Test

1. Bob has 36 candy bars. He eats 29 .

What does he have now?
Diabetes
Bob has diabetes.

Maths

## How we teach maths: National Curriculum 2014

## Aims

Fluency ...Sense of playfulness with number, seeing patterns, seeing numbers within numbers....

Reasoning ...Making sense of maths and explaining connections...

Problem Solving ...Using and applying maths understanding and skills to different contexts/ puzzles ...

## Equals... equivalence.. balance

'Old' style = means 'answer'

$$
\begin{aligned}
& 8+4= \\
& 4+8=
\end{aligned}
$$

$$
7+5=8+
$$

'New style' maths

$$
\begin{gathered}
8+4= \\
12=\square+4 \\
120=80+ \\
7+\square=8+\square \\
+\square=\square+\square
\end{gathered}
$$

$\square$

$$
+\square
$$

## Equals... equivalence.. balance

Maths


## Greater depth

Is it possible to only use odd numbers for the missing boxes? Or just even numbers?

Using just the digits 1-7?
Can you change the operation $+-\mathrm{x} \div$ and keep the balance?

UKS2 Can this be completed using prime numbers only?

## Mastery approach

- Learning sequences build on each other and help children make connections between mathematical concepts.

Maths

- Longer time on key concepts to give secure foundations - not dawdling but deepening
- Time to think deeply about maths - with same focus/pace for most of class but opportunities for broadening and deepening
- An inclusive approach that helps to build selfconfidence, with misconceptions tackled as they happen
- Not accelerating onto later year's content or larger numbers - challenge with same concept


## Concrete... pictorial... abstract

Maths



## Concrete manipulatives

Maths

I know I have 35 beads on this side and 46 on this side. What will I need to do to find out how many the missing part is equal to?

Maths

## Manipulatives that your children

 will be routinely using in class

Base 10
'Diefles'
equipment


Diceio

## Maths Pictures 'Jottings'




Maths

## Fluency

...Sense of playfulness with number, seeing patterns, seeing numbers within numbers....

$$
8+9=
$$

Children need strategies beyond using concrete apparatus and counting:

Near doubles<br>Bridging ten<br>Rounding and adjusting

## Fluency

...Sense of playfulness with number, seeing patterns, seeing numbers within numbers....
Maths

$$
\text { If } 185+427=612
$$

Complete this calculation:

$$
162+\ldots=612
$$

Explain your strategy.

21-16
is the same as 20-15



Maths

## Lack of Fluency

Children who leave KS1 counting
$3+4$ on fingers, not secure on doubling, halving and basic number + and - facts
face a real problem when learning written methods to add or subtract in Year 3

You can really help support your child at home to develop their fluency (more later)

## Reasoning

## If $\mid$ know $8+9=17$ what else do l know?

$$
80+90=\quad 8+9=17 \quad 17-8=9
$$

$$
0.8+0.9=
$$

The same is true for multiplication -

## Working from the base fact:

$$
6 \times 4=24
$$

What else do we know?

$$
4 \times 0.6=2.4 \quad 60 \times 40=2400
$$

$$
24 \div 4=6
$$

$$
240 \div 6=40
$$

## Reasoning

## Here are 4 numbers:

What do you notice about these numbers?
8
16
15
23

Which is the odd one out and why?
Explain your reasons

## Problem - solving

> Can you put the twenty digits into the five boxes to make the four-diait as close to pal
five boxes to make the four-digit numbers
as close to each target as possible?
Maths

| 0 | 1 | 2 | 3 | 4 |
| :--- | :--- | :--- | :--- | :--- |
| 0 |  |  |  |  |

4LS19
Step 13 Circles

Use each of the numbers below once. Replace each shape in the circles with one of the numbers. The sum of each of the circles must be the same.

largest odd nun
largest even nun
largest multiple of
smallest multiple of
number closest to 50


Can you find other ways of ma:
Mrs Jones has $£ 20$ to spend on presents.
She buys 4 mugs and 3 teddy bears. What is the greatest number of keyrings she can buy?


## Talk frames

## Maths

- Help to develop maths language/ vocabulary and encourages full explanations
- Support and scaffold less confident learners
$\square$ ones, $\square$ tenths and $\square$ hundredths




## Conversation cartoons



## Who is right? Prove it!

## Importance of Mathematical Talk

Maths

$$
\begin{array}{c|c}
1024-512 & 754-149 \\
\hline 812-562 & 1003-997
\end{array}
$$

I noticed that... so I chose this strategy because

## CPA and talk together

## Taken from an early Year 4 sequence

Maths


## Our maths week:

Core Learning (5 sessions) Herts for Learning Essentials Maths Customised to our learners by additional challenge and carefully crafted practise opportunities sourced by teachers. Includes scaffolds to support the closing of gaps and ARE questions to help assessment.

Fluency Skills - discrete teaching sessions focusing on fluency to keep new skills live, often using games. Weekly arithmetic and number fact practise. E-learning e.g. using Numbergym.

Additional pre-teaching and intervention to support children as needed.
Cross curricular opportunities to give maths meaning and purpose.
Homework - overlearning number facts, practising of key concepts, topic opportunities (e.g. recipes, statistics).


Weekly - 15 minutes- to consolidate methods learned. Marks tracked.

## Programme of Study LKS2

The National Curriculum, detailed Programmes of Study, and Year group learner documents are all on the school website. You can also find information about what's coming up in maths
on our termly class newsletter.

## Maths

Fluency - confidence with calculating $+-x$ and $\div$ with whole numbers and introduced to decimals
Reading, writing, regrouping, ordering and rounding numbers Representing numbers in different ways

Fractions - of quantities, tenths, hundredths, + and - fractions Geometry - different quadrilaterals and triangle names in Measure - especially converting Statistics
Telling the time - to nearest minute by end Year 4. Times tables $x 3, x 4$ and $x 8$ secure by end Year 3. all $x$ tables secure by end of Year 4 Solving problems and reasoning with the above!

## Fluency focus:

Year 3 Year 4
HTO.t ThHTO.th

Maths

## Multiplication Table Check

By end of year 4, the National Curriculum states that children should know all their times table facts fluently.

The government have introduced a nationwide test.
Voluntary in 2019, statutory in 2020
We will be doing the pilot this year in the Summer Term with Year 4

- digital test
- multiplication facts only (no divides)
- will take less than 5 minutes to complete on screen
- 6 seconds per question
- emphasis will be on $6,7,8,9$ and 12 times tables
- will be out of 25 and no threshold given
- Will help schools put into place interventions for children who do not have a secure understanding in UKS2


## Multiplication Table Check

 SimulatorMaths
Nearest simulation to MTC available at Mathsframe:
https://mathsframe.co.uk/en/resources/resource/477/Multiplicati on-Tables-Check

Programme of Study Year 3
The National Curriculum, detailed Programmes of Study, and Year group learner documents are all on the school website. You can also find information about what's coming up in maths on our termly class newsletter.

## Ma Wear 3 programme of study (statutory requirements)

| Number and place value <br> Pupils should be taught to: <br> - count from 0 in multiples of $4,8,50$ and 100 ; find 10 or 100 more orless than a given number <br> - recognise the place value of each digit in a three-digit number (hundreds, tens, ones) <br> - compare and order numbers up to 1000 <br> - identify, represent and estimate numbers using different representations <br> - read and write numbers up to 1000 in numerals and in words <br> - solve number problems and practical problems involving these ideas | Addition and subtraction <br> Pupils should be taught to: <br> - add and subtract numbers mentally. including: <br> - a three-digit number and ones <br> - a three-digit number and tens <br> - a three-digit number and hundreds <br> - add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction <br> - estimate the answerto a calculation and use inverse operations to check answers <br> - Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | Multiplication and division <br> Pupils should be taught to: <br> - recall and use multiplication and division facts for the 3,4 and 8 multiplication tables <br> - write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times onedigit numbers, using mental and progressing to formal written methods <br> - solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to mobjects | Fractions <br> Pupils should be taught to: <br> - count upand down in tenths; recognise that tenths arise from dividing an objectinto 10 equal parts and in dividing one-digit numbers or quantifies by 10 <br> - recognise, find and write fractions of a discrete set of objects: unit fractions and nonunit fractions with small denominstors <br> - recognise and use fractions as numbers: unit fractions and nonunit fractions with small denominators <br> - recognise and show, using diagrams, equivalent fractions with small denominstors <br> - add and subtract fractions with the same denominator within one whole (for example, $\left./_{T}+i_{T}=i_{T}\right)$ <br> - compare and order unit fractions, and fractions with the same denominators <br> - solve problems that involve all of the above | Measurement <br> Pupils should be taught to: <br> - messure, compare, add and subtract: lengths ( $\mathrm{m} / \mathrm{cm} / \mathrm{mm}$ ); mass ( $\mathrm{kg} / \mathrm{g}$ ): volume/capacity ( $/ \mathrm{ml}$ ) <br> - measure the perimeter of simple 2-D shapes <br> - add and subtract amounts of money to give change, using both £ and $p$ in practical contexts <br> - tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12 -hour and 24 -hour clocks <br> - estimate and read time with incressing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight <br> - know the number of seconds in a minute and the number ofdays in each month, year and leap year <br> - compare durations of events [for example to calculate the time taken by particular events or tasks] | Geometry: properties of shapes <br> Pupils should be taught to: <br> - draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them <br> - recognise that angles are a property of shape or a description of a turn <br> - identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle <br> - identify horizontal and vertical lines and pars of perpendicular and parallel lines | Statistics <br> Pupils should be taught to: <br> - interpretand present data using bar charts, pictograms and tables <br> - solve one-step and two-step questions[ for example, "How many more?' and 'How many fewer?] using information presented in scaled bar charts and pictograms and tables |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

## Programme of Study Year 4

The National Curriculum, detailed Programmes of Study, and Year group learner documents are all on the school website. You can also find information about what's coming up in maths
on our termly class newsletter.

## M jrear 4 programme of study (statutory requirements)

| Number and place value <br> Puplls should be taught io: <br> - count in multplas of 6, 7, 9, 25 and 1000 <br> - find 1000 more ar lass than a glven number <br> - count backwards through zero to Include negative numbers <br> - recognlise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) <br> - order and compare numbers beyond 1000 <br> - Identify, represent and estimate numbers using difterent representations <br> - round any number to the nearest 10, 100 or 1000 <br> - solve number and practical problems that imvolve all of the above and with Incressingly large posilive numbers <br> - read Roman numerals to 100 ( 110 C ) and know that over time, the numeral system changed to Include the concept of zero and place value | Addition and subtraction <br> Puplis should be taught to: <br> - add and subtract numbers with up to 4 dgits using the formal written methods of columnar addtion and subtraction where <br> appropriate <br> - estmate and use inverse operations to check <br> answers to a calculation <br> - solve addtion and subtraction two-stap problems in comberts, deciding which operations and methods to use and why | Muitiplication and division <br> Puplls should be taught to: <br> - recall multplication and divislon facts for multplication tables up 10 $12 \times 12$ <br> - use place value, known and derlved facts to multply and divide mentaly, Including: multplying by 0 and 1 ; dividing by 1 ; multplying logether three numbers <br> - recognise and use factor pairs and commutativity in mental calculations <br> - multply two-digit and three-diglt numbers by a one-diglt number using formal written layout <br> - solve problems Imoliving multplying and adding, including using the distributive law to multply two digit numbers by one digit, integer scalling problems and harder correspondence problems such 35 n objects are connected to moblects | Fractions (Including decimale) <br> Pupls should be taught to: <br> - recognise and show, using dagrams, tamilles of common equivalent tractions <br> - coumt up and down in hundredths; recognise that hundredths arise when dividing an oblect by a hundred and diving tenths by ten. <br> - solve problems imvoling increasingly harder tractions to calculate quanttes, and tractions to divide quanttes, Including non-unit tractions where the answer is a whole number <br> - add and subtract factions with the same denominator <br> - recognise and write decimal equivalents of any number of tenths or hundredths <br> - recognise and write decimal equivalents to ${ }^{1} / I_{4}{ }^{1} I_{2} z^{2} /_{4}$ <br> - find the effect of dividing a one- or two-diglt number by 10 and 100 , identifying the value of the digits in the answer 35 ones, tentis and hundredths <br> - round decimals with one decimal place to the nearest whole number compare numbers with the same number of decimal places up to two decimal places <br> - solve simple massure and money problems limoving tractions and decimals to two decimal places | Messurement <br> Puplls should De taught io: <br> - convert detween different units of measure flor example, <br> killometre 10 metre; hour to minute] <br> messure and calculate the perimeter of a rectilnaar figure (Including squares) in centimetres and metres <br> - Find the area of rectilinear shapes by counting <br> squares <br> - estimate, compare and calculate different measures, Including money in pounds and pence <br> - read, write and convert time between analogue and digital 12 and 24-hour clocks solve problems Irvolving corverting from hours to minutes; minutes to seconds; years to months; weeks to days | Geometry: propertles of вhapes <br> Puplls should be taught to: <br> - compare and classily geometric shapes, Including quadrilaterals and triangles, based on thal propertles and slzes <br> - Identity acute and obtuse angles and compare and order angles up to two right angles by slze <br> - Identify lines of symmetry in 2-D shapes presented in different orlentations <br> - complete a slmple symmetric figure with respect to a specific line of symmetry | Geometry: position and direction <br> Puplls should be taught 10: <br> - describe positions on a 2-D grid 35 coordinates In the frst quadrant <br> - describe movements between positions 35 translations of a glven unit to the lethilight and upldown <br> - piot specifed points and draw sldes to complete a glven polygan | Statistics <br> Puplls should be taught to: <br> - Imterpret and present dscrete and continuous data using appropriate graphical methods, including bar charts and time graphs <br> solve comparison, sum and difference problems using information presented in par charts, pictograms, tables and other graphs |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |




Maths

## Enjoying maths at home

1. Praise your child for effort
2. When checking homework, celebrate mistakes and help your child to make sense of them.
3. All mistakes are beautiful and a learning opportunity!
4. Try not to show frustration. Take a break, let everyone calm down and come back to it
5. Do not pressurise children. Whilst knowing times tables is important, it doesn't make you a bad mathematician if you can't remember them.
6. Promote a positive 'can do' attitude towards maths
7. Show yourself to be curious about maths and playful with numbers. Make it fun!

## How can parents help at home

- Especially in years 1,2,3 Counting and dice games, card games, any maths games!
- Look for Maths in the Every Day (next slide)
- Practise number facts at home (continue beyond Yearr 4)
+ and - facts to 10, 20
$x$ tables
base facts
Come in and ask us if you need advice!

Maths in the Every Day


## Need help with strategies?

School Journals - contain examples of written methods we use, explanations of fractions, shapes, perimeter, area, rounding, time etc.

- Lots of detail!
- Please look at them and encourage children to use them to support homework

Come in and ask us if you need advice!

## E-learning that supports maths

## and children can log onto free from home

Maths

'Numbergym'

User name: ashwell Password: silver
This is an excellent resource to help with learning in all areas of maths. Bond Builder and Table Trainer are accessible via tablet.


Purple Mash


## Years 3 and 4

Maths

Number Blocks TV Show simple but still relevent


Orchard Toys Board Games


Free trial but then by subscription

## Time to try our activities!

Many thanks for attending tonight. We hope you have found it useful.

Please fill in our evaluation survey.


Mrs Wild's talk about mental health begins at 7pm in the main hall!

## Activity 1

Here are 4 numbers:

## $8 \quad 16 \quad 15 \quad 23$

Which is the odd one out and why?

## Activity 2

'A sense of number'

- Take a strip of paper.
- Stick it down with blue tack.
- Label one end 0 and the other end 1000.
- Place a counter on the line where you would find the number 650.
- How did you decide where to put the counter?
- Now label the number line 200 to 900.
- How does this change your thinking?


## Activity 3

- Using the digit cards make an addition that works (TU + TU).
- Make the answer 120

$$
57+63
$$

- Largest , smallest etc
- How many additions


## can you make?

- Try a subtraction


A puzzle!


## Activity 4



Which of these shapes has $3 / 4$ shaded blue?
Now invent your own puzzle like this using repeating regular shapes.

## Activity 5

Can you show this calculation in Base 10? Can you use the equipment to make it ten times bigger?
$34+23=57$
Base 10 equipment:


## Activity 6 - Factors investigation

- Take 24 cubes.
- Make them into an oblong (rectangle), different to your partner?
- How many different oblongs can you make?
- How could you record them as number sentences?
- Now repeat for other numbers from 1-20
- Now investigate..... What is special about the numbers $1,2,3,5,7,11,13,17,19$.


## Activity 7 - Dice Problems

## The Stacked Dice Problem

Antonio stacks 3 dice and then finds the sum of all of the numbers that are showing (on the sides and top of the stack).

Question: What is the greatest sum that Antonio can make with the threedice tower?


Challenge: What if Antonio stacks 20 dice? What is the greatest possible sum?

## Activity 7 - Dice Problems

- Solution: The sum of any two opposite faces of a die is 7. So, excluding the top face, the sum of the numbers on the 3 -dice tower is always equal to $7 \times 2 \times 3=42$, and it doesn't matter how we arrange the dice. The only thing that affects the total sum is the number showing on the top, which can be any number from 1 to 6 . So the minimum sum is $42+1=43$ and the maximum sum is $42+$ $6=48$.
- For 20 dice, the minimum sum is $7 \times 2 \times 20+1=281$ and the the maximum sum is $7 \times 2 \times 20+6=286$. For $n$ dice, the minimum sum is $7 \times 2 \times n+1$ and the maximum sum is $7 \times 2 \times n+6$.


## Activity 8 - Bead strings

- Play this game in pairs - divide a bead string into two.
- One person - work out the number at one side.
- Partner works out what makes 100 then checks using the other part of the bead string.
- Now split the bead string into 3 . Work out the middle number from knowing the numbers on either side.
- What if the whole bead string was worth 1000 ?
- What if the bead string was worth 1 ?

