## 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



#### Select some cards...

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

#### Examples...

10 - 8 = 2 $10 - 1 \times 2 = 18$  $8 \div 2 = 4$  $10 \times 8 \times 2 = 160$ 

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





## How do you feel about maths?

**Ma**ths





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





## Why we do things differently...

#### Maths



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

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





## 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

Maths

'New style' maths 'Old' style = 8 + 4 = means 'answer' 8 + 4 = 12 = +4120 = 80 +4 + 8 = = 8 + 7+ 7 + 5 = 8 +



## 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 + - x ÷ 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.
- 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



Maths



### Concrete... pictorial... abstract





## **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?



# Manipulatives that your children will be routinely using in class















Part-Whole Models



## 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 Bridging ten Rounding and adjusting



## Fluency

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

Taken from a Year 4 sequence: If 185 + 427 = 612Complete this calculation:  $162 + \_\_= 612$ Explain your strategy.

#### Year 2: Equal difference

21- 16 is the same as 20-15





## 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 earning written methods to add or subtract in Year 3 Children who leave Year 4 not knowing all their times table facts find accessing calculation work, fractions, decimals, area much slower in Years 5 and 6

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





### If I know 8 + 9 = 17, what else do I know?

80 + 90 = 8 + 9 = 17  $_{17 - 8 = 9}$ 

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 x 0.6 = 2.4 60 x 40 = 2400

 $24 \div 4 = 6$   $240 \div 6 = 40$ 





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**





## Talk frames

Maths

## Help to develop maths language/ vocabulary and encourages full explanations Support and scaffold less confident learners

4LS16	Step 1 Speaking Frame				
	Speaking Frame	4LS16 Step 6 Speaking Frame			
	ones, tenths and hundredths	Rounding - Speaking Frame			
		☐ is the whole number before ☐ ☐ is the whole number after ☐			
		is closer to than is when rounded to the nearest whole			
	© Herts for Learning Ltd - 2017 ESSENTIAL maths	number. □≈□			
		Herts			

🐔 for Learning



### **Conversation cartoons**



## Who is right? Prove it!



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



## CPA and talk together

#### Taken from an early Year 4 sequence



## Our maths week:



Maths

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).



#### Arithmetic Maths 100 - 20 =13 = 26 - 4 = 11+ 14 = 201/2 of 4 = 1 43 + 10 = 53 37 + 12 = 49 1,079 + 6,729 = 257 × 5 = 1,285 94+2= 47 85 x 2 = 170 400 - 172 = 56 ÷ 4 = 14 725 - 186 = 2 x 5 x 2; $1\frac{1}{2} \times 4 =$ = 36 ÷ 100 = X 4 = 0. 6 92 x 300 3/10 mill Communitor minut Solum 9 9 111 00 40 10 11 3 80

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 ÷ 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 Year 4 Measure – especially converting

**Statistics** 

Telling the time - to nearest minute by end Year 4. Times tables x3, x4 and x8 secure by end Year 3. all x tables secure by end of Year 4 <u>Solving problems and reasoning with the above!</u> Fluency focus:Year 3Year 4HTO.tThHTO.th345.65456.78



## 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 Simulator

Maths

Nearest simulation to MTC available at Mathsframe:

https://mathsframe.co.uk/en/resources/resource/477/Multiplicati on-Tables-Check



Ma

## 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.

#### Year 3 programme of study (statutory requirements)

Number and place	Addition and	Multiplication and division	Fractions	Measurement	Geometry: properties of	Statistics
value	subtraction				shapes	
		Pupils should be taught to:	Pupils should be taught	Pupils should be taught to:		Pupils should be
Pupils should be taught	Pupils should be		to:		Pupils should be taught	taught to:
to:	taught to:	<ul> <li>recall and use multiplication</li> </ul>		<ul> <li>measure, compare, add</li> </ul>	to:	
		and division facts for the 3, 4	<ul> <li>count up and down in</li> </ul>	and subtract: lengths	a dama Disharana di	<ul> <li>Interpretand</li> </ul>
<ul> <li>count from 0 in</li> <li>multiples of 4, 9, 50</li> </ul>	<ul> <li>add and subtract</li> </ul>	and 8 multiplication tables	tenths; recognise that	(m/cm/mm); mass (kg/g);	<ul> <li>draw 2-D shapes and make 2-D shapes</li> </ul>	present data
and 100: find 10 or	including:	<ul> <li>write and calculate</li> </ul>	dividing on objectinto	volume/capacity (vm)	using modelling	charts
100 more or less	- a three-digit	methematical statements for	10 equal parts and in	measure the perimeter	materials: recognise	nictograms and
than a given	number and ones	multiplication and division	dividing one-digit	of simple 2-D shapes	3-D shapes in	tables
number	- a three-digit	using the multiplication tables	numbers or quantities		different orientations	
	number and tens	that they know, including for	by 10	<ul> <li>add and subtract</li> </ul>	and describe them	<ul> <li>solve one-step</li> </ul>
<ul> <li>recognise the place</li> </ul>	<ul> <li>a three-digit</li> </ul>	two-digit numbers times one-	<ul> <li>recognise, find and</li> </ul>	amounts of money to		and two-step
value of each digit	numberand	digit numbers, using mental	write fractions of a	give change, using both	<ul> <li>recognise that angles</li> </ul>	questions[ for
in a three-digit	hundreds	and progressing to formal	discrete set of objects:	£ and p in practical	are a property of	example, 'How
number (hundreds,		written methods	unit fractions and non-	contexts	shape or a description	many more?"
tens, ones)	<ul> <li>add and subtract</li> </ul>	a salua ambiana indudian	unit fractions with	a tall and write the time	of a turn	and How many
<ul> <li>compare and order</li> </ul>	three digits using	<ul> <li>solve problems, including missing number problems</li> </ul>	<ul> <li>mail denominators</li> <li>recognise and use</li> </ul>	<ul> <li>tell and write the time from an analogue clock</li> </ul>	<ul> <li>identify right engles</li> </ul>	information
numbers up to 1000	formal written	involving multiplication and	fractions as numbers:	including using Roman	<ul> <li>recognise that two</li> </ul>	presented in
	methods of	division including positive	unit fractions and non-	numerals from I to XII	right angles make a	scaled bar
<ul> <li>identify, represent</li> </ul>	columnar addition	integer scaling problems and	unit fractions with	and 12-hour and 24-hour	half-turn, three make	charts and
and estimate	and subtraction	correspondence problems in	small denominators	clocks	three guarters of a	pictograms and
numbers using		which n objects are connected	<ul> <li>recognise and show,</li> </ul>		turn and four a	tables
different	<ul> <li>estimate the</li> </ul>	to m objects	using diagrams,	<ul> <li>estimate and read time</li> </ul>	complete turn; identify	
representations	answerto a		equivalent fractions	with increasing accuracy	whetheranglesare	
	calculation and use		with small	to the nearest minute;	greater than or less	
<ul> <li>read and write</li> </ul>	inverse operations		denominators	record and compare time	than a right angle	
in numbers up to 1000	to check answers		<ul> <li>add and subtract fractions with the</li> </ul>	minutes and hours: use	<ul> <li>identify borizontal and</li> </ul>	
words	<ul> <li>Solve problems</li> </ul>		same denominator	vocebulery such as	vertical lines and pais	
	including missing		within one whole (for	o'clock, a.m./p.m.	of perpendicular and	
<ul> <li>solve number</li> </ul>	number problems,		3 1 6	morning, afternoon, noon	parallel lines	
problems and	using number		example, $1, + 1, = 1$	and midnight		
practical problems	facts, place value,		<ul> <li>compare and order</li> </ul>	-		
involving these	and more complex		unit fractions, and	<ul> <li>know the number of</li> </ul>		
ideas	addition and		tractions with the	seconds in a minute and		
	subtraction		<ul> <li>same denominators</li> </ul>	the number of days in		
			involve all of the	each month, year and		
			above	ieap year		
				<ul> <li>compare durations of</li> </ul>		
				events (for example to		
				calculate the time taken		
				by particular events or		
				tasks]		



## 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.

#### Year 4 programme of study (statutory requirements)

Number and place	Addition and	Multiplication and	Fractions (including decimals)	Measurement	Geometry:	Geometry:	Statistics
value	subtraction	division	Dunis should be taught to:		properties of	position and	
Pupils should be			Papilo ciloado de labajin la.	Pupils should be	shapes	direction	Pupils should be
taught to:	Pupils should be	Pupils should be taught to:	<ul> <li>recognise and show, using diagrams,</li> </ul>	taught to:			taught to:
bogin to:	taught to:		families of common equivalent		Pupils should be	Pupils should	
<ul> <li>count in multiples</li> </ul>		<ul> <li>recall multiplication and</li> </ul>	fractions	<ul> <li>convert between</li> </ul>	taught to:	be taught to:	<ul> <li>Interpret and</li> </ul>
of 6, 7, 9, 25 and	<ul> <li>add and</li> </ul>	division facts for	<ul> <li>count up and down in hundredths;</li> </ul>	different units of			present
1000	subtract	multiplication tables up	recognise that hundredths arise when	measure (for	<ul> <li>compare and</li> </ul>	<ul> <li>describe</li> </ul>	discrete and
<ul> <li>find 1000 more or</li> </ul>	numbers with	to 12 × 12	dividing an object by a hundred and	example,	classify	positions	continuous
less than a given	up to 4 digits	<ul> <li>use place value, known</li> </ul>	dividing tenths by ten.	kliometre to	geometric	on a 2-D	data using
number	using the	and derived facts to	<ul> <li>solve problems involving increasingly</li> </ul>	metre; hour to	shapes,	grid as	appropriate
<ul> <li>count backwards</li> </ul>	formal written	multiply and divide	harder tractions to carculate	minute]	Including	coordinates	graphical
through zero to	methods of	mentally, including:	quantities, and tractions to divide	<ul> <li>measure and</li> </ul>	quadrilaterais	In the first	methods,
Include negative	columnar	multiplying by 0 and 1;	quantities, including non-unit fractions	calculate the	and triangles,	quadrant	including bar
	addition and	aviaing by 1,	<ul> <li>add and subtract fractions with the</li> </ul>	perimeter of a	based on their	<ul> <li>describe</li> </ul>	charts and
<ul> <li>recognise the</li> </ul>	subtraction	multiplying together	<ul> <li>add and subtract inactions with the same dependenter.</li> </ul>	rectilinear figure	properties and	movements	ume graphs
each dioit in a	where	three numbers	<ul> <li>recommise, and write decimal</li> </ul>	(including	SIZES	between	<ul> <li>solve</li> </ul>
four-dialt number	appropriate	<ul> <li>recognise and use</li> </ul>	<ul> <li>recognise and write decinial applyplants, of any number of tenths</li> </ul>	squares) in	<ul> <li>identity acute</li> </ul>	positions	companison,
(thous ands	<ul> <li>estimate and</li> </ul>	actor pairs and	or hundrarths	centimeties and	and obluse	do translations	sum and
bundrade tens	use inverse	commutativity in	reconnise and write decimal	- find the area of	angles and	of a olymp	onerence problems
and ones)	operations to	<ul> <li>multiply two-digit and</li> </ul>		rectlinear	order anales	unit to the	using
<ul> <li>order and</li> </ul>	Crieck	three-digit numbers by	equivalents to /; /; /	shapes by	up to two right	leftright	Information
compare	calculation	a one-digit number	<ul> <li>find the effect of dividing a one- or</li> </ul>	counting	angles by size	and	presented in
numbers beyond	<ul> <li>calculation</li> <li>calculation</li> </ul>	using formal written	two-digit number by 10 and 100,	sources	<ul> <li>Identity lines</li> </ul>	unidown	har charts
1000	<ul> <li>solve addition</li> </ul>	lavout	identifying the value of the digits in	<ul> <li>estimate</li> </ul>	of symmetry	<ul> <li>plot</li> </ul>	pictoorams
<ul> <li>Identify, represent</li> </ul>	subtraction	<ul> <li>solve problems</li> </ul>	the answer as ones, tenths and	compare and	In 2-D shapes	specified	tables and
and estimate	two-step	involving multiplying	hundredths	calculate	presented in	points and	other graphs
numbers using	problems in	and adding, including	<ul> <li>round decimals with one decimal</li> </ul>	different	different	draw sides	and Broken
different	contexts	using the distributive	place to the nearest whole number	measures.	orientations	to complete	
representation s	deciding	law to multiply two digit	<ul> <li>compare numbers with the same</li> </ul>	including money	<ul> <li>complete a</li> </ul>	a olven	
<ul> <li>round any</li> </ul>	which	numbers by one digit,	number of decimal places up to two	In pounds and	simple	polygon	
number to the	operations	Integer scaling	decimal places	pence	symmetric		
nearest 10, 100	and methods	problems and harder	<ul> <li>solve simple measure and money</li> </ul>	<ul> <li>read, write and</li> </ul>	figure with		
or 1000	to use and	correspondence	problems involving fractions and	convert time	respect to a		
<ul> <li>solve number and</li> </ul>	why	problems such as n	decimals to two decimal places	between	specific line of		
practical		objects are connected		analogue and	symmetry		
problems that		to m objects		digital 12 and			
involve all of the				24-hour clocks			
above and with				<ul> <li>solve problems</li> </ul>			
Increasingly large				Involving			
positive numbers				converting from			
<ul> <li>read Roman</li> </ul>				hours to			
numerals to 100				minutes; minutes			
(TO C) and know				to seconds;			
that over time,				years to months;			
system channed				weeks to days			
to include, the							
concept of zero							
and place value							
and prove value							



### Year 3 and 4 Learning in Action!

Maths





1.

2.

Maths

## Enjoying maths at home

Praise your child for effort

- When checking homework, celebrate mistakes and help your child to make sense of them.
- 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

Maths

- 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?

Maths

- 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' www.numbergym.co.uk

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





Number Blocks TV Show – simple but still relevent



Orchard Toys Board Games



Free trial but then by subscription





### Time to try our activities!

Maths

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



Maths

### Please fill in our evaluation survey.





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

Here are 4 numbers:

## 8 16 15 23

Which is the odd one out and why?

'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?

- 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!





# Which of these shapes has ¾ shaded blue?

Now invent your own puzzle like this using repeating regular shapes.

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



## 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 x 2 x 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 x 2 x 20 + 1 = 281 and the the maximum sum is 7 x 2 x 20 + 6 = 286. For n dice, the minimum sum is 7 x 2 x n + 1 and the maximum sum is 7 x 2 x 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?