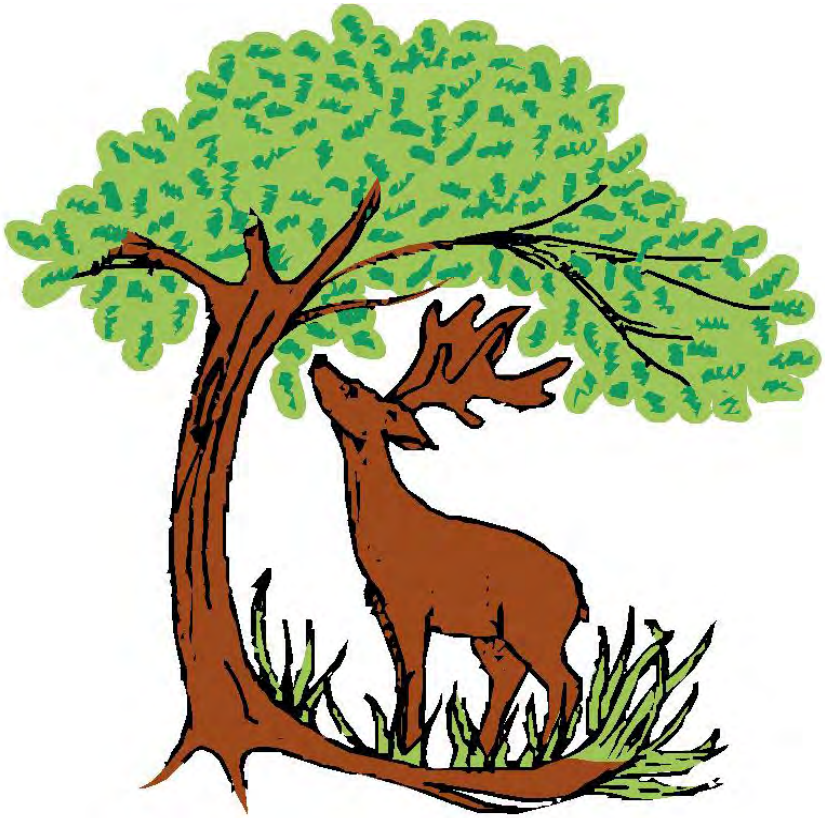
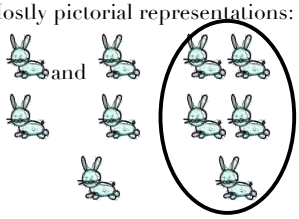
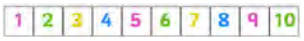
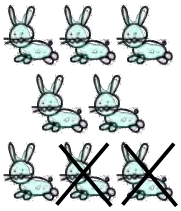
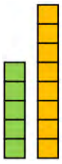
Help your child learn to calculate.



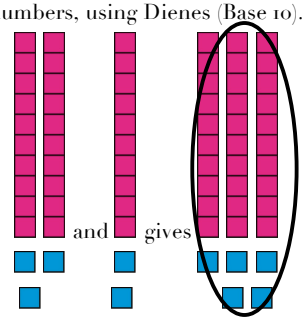
Hethersett Woodside Infant and Nursery School

During their time at this school children will be encourages to see Mathematics as both a written and spoken language.

	Addition Representations		Subtraction Representations	
	Concrete	Written	Concrete	Written
Stage 1	Concrete representations model how the addition of two groups is done through combining sets:  Other equipment: counters, small toys, buttons, multilink, pegs, etc. Simple number tracks to count up on:  *"What is 1 more than 4?"*	Mostly pictorial representations: 	Concrete representations model how one number of objects is taken away from a larger group.  *5 objects 'take-away' 2 objects* Other equipment: counters, small toys, buttons, multilink, pegs, etc. Simple number tracks to count back on:  *"6 take away 2"*	Mostly pictorial representations: 
Stage 2	Children continue to use number tracks and hundred squares to count up on. They also begin using number lines to count in a series of single jumps. 	As above, creating pictorial representations of the concrete activities and then recording the corresponding number sentence. **Missing boxes:** 5 + 3 = ☐ ☐ = 5 + 3	Children continue to use number tracks and hundred squares to count back on. They also begin using number lines to count back a series of single jumps.  <u>Subtraction as finding the difference</u> Children develop an understanding of subtraction as finding the difference by looking at two numbers and identifying 'how many more' one number is  *'What is the difference between 5 and 8?'*	As above, creating pictorial representations of the concrete activities and then recording the corresponding number sentence. **Missing boxes:** 5 - 3 = ☐ ☐ = 5 - 3

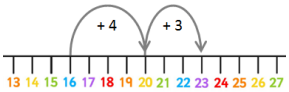
Stage 3

Children bring their knowledge of place value when adding 2-digit numbers, using Dienes (Base 10).



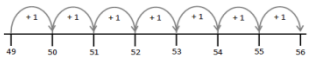
23 + 12 = 35

Children bring their knowledge of number bonds when adding 1-digit numbers, jumping to the nearest 10 and then adding the rest.



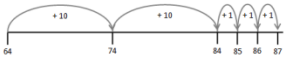
16 + 7 = 23

Empty number lines are used in a similar way as in the concrete representations, enabling children to work with larger numbers.



49 + 7 = 56

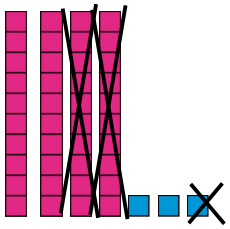
Children become more efficient by using jumps in multiples of 10.



Missing boxes:

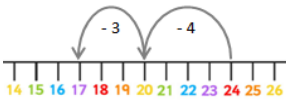
14 + 5 = ☐ ☐ = 14 + 5

Children bring their knowledge of place value when subtracting 2-digit numbers, using Dienes (Base 10).



43 21 = 22

Children bring their knowledge of number bonds when subtracting 1-digit numbers, jumping to the nearest 10 and then taking the rest away.



24 7 = 17

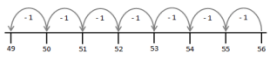
Subtraction as finding the difference

Children are able to find the difference practically by cutting up number lines. They learn that the only bit that they are interested in is that between the two numbers. This explains why you count up.

'What is the difference between 9 and 15?'

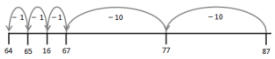
Empty number lines are used in a similar way as in the concrete representations, enabling children to work with larger numbers.

Subtraction as take-away



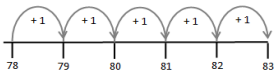
56 7 = 49

Children become more efficient by using jumps in multiples of 10.



Subtraction as finding the difference

Moving away from the concrete, children are able to find the difference by counting up.



83 78 = 5

Missing boxes:

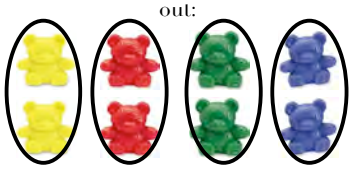
24 5 = ☐ ☐ = 24 5

Multiplication

Concrete

Stage 1

Concrete representations model how the groups of the same number of objects are counted out:

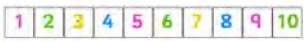


How many are there in 4 groups of 2?

Other equipment: counters, small toys, buttons, multilink, pegs, etc.

Stage 2

Number tracks to count up on in equal steps:

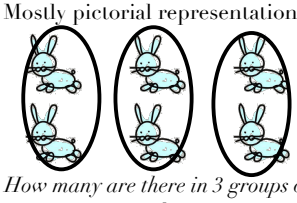


"Can you count in 2s?"

Written

Stage 1

Mostly pictorial representations:

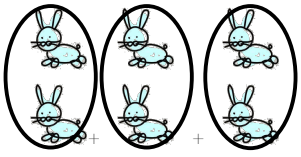


How many are there in 3 groups of 2?

Stage 2

As above, creating pictorial representations of the concrete activities and then recording the corresponding number sentence.

:



2 + 2 + 2

There are groups of 2, 3 times. This is written:

2 x 3

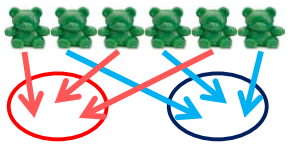
Division

Concrete

Stage 1

Practical activities involving:

Sharing



"How many are in each group?"

Grouping

"How many groups are there?"

Other equipment: counters, small toys, buttons, multilink, pegs, etc

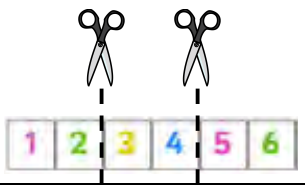
Stage 2

As above, including children being able to practically show grouping on a bead string.

"How many groups of 2 are there in 8?"

Repeated Subtraction

Number tracks are used for repeated subtraction groups of numbers are cut off.



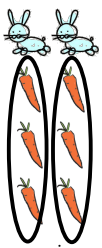
Written

Stage 1

Stage 2

Pictorial representations of the concrete activities:

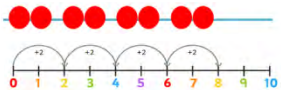
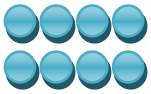
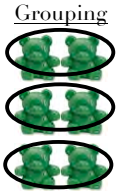
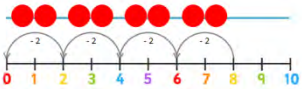
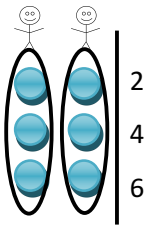
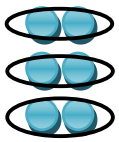
Sharing



"How many are in each group?"

Grouping

"How many groups are there?"

Stage 3	Using a range of concrete equipment, children will be able to create and describe arrays using concrete representations.  4 x 2 = 8  2 x 4 = 8 <u>Repeated Addition</u> They will also be able to show repeated addition on number lines. To strengthen understanding children use concrete representations, such as bead strings, alongside the number lines.  2 + 2 + 2 + 2 = 2 x 4 = 8	Children will be able to create pictorial representations of their arrays.  4 x 2 = 8  2 x 4 = 8 **Missing boxes:** 5 X 3 = ☐ ☐ = 5 X 3	Using a range of concrete equipment, children practically arrange arrays. <u>Sharing</u> (between two children)  *"How many are in each group?"* <u>Grouping</u>  *"How many groups are there?"* <u>Repeated Subtraction</u> Children are able to use repeated subtraction along a number line. To strengthen understanding children use concrete representations, such as bead strings, alongside.  8 ÷ 2 = 4	As above, plus: Using their knowledge of arrays. <u>Sharing</u>  <u>Grouping</u>  **Missing boxes:** 6 ÷ 2 = ☐ 24 ÷ ☐ = 6

Teachers will support and guide children through the following important stages:

- developing the use of concrete resources, pictures and a mixture of words and symbols to represent numerical activities;
- using standard symbols and conventions;
- use of jottings to aid a mental strategy;
- use of pencil and paper procedures.

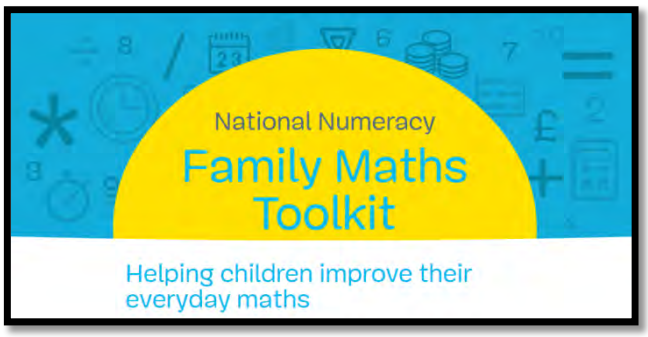
It is important that children do not abandon jottings and mental methods once pencil and paper procedures are introduced. Therefore children will always be encouraged to look at a calculation or problem and then decide which is the best

method to choose concrete resources, pictures, mental calculations (with or without jottings) or structured recording.

Our long term aim is for children to be able to select an efficient method of their choice (whether it is mental or written) that is appropriate for a given task. They will do this by always asking themselves:

* **"Can I do this in my head?"**
* **"Can I do this in my head using drawings or jottings?"**
* **"Do I need a pencil and paper procedure?"**

For further information about how to help your child with Mathematics, visit the following website:



http://www.familymathstoolkit.org.uk/