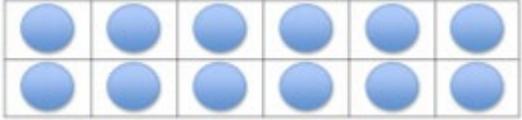




Woodland Academy Trust
EYFS Calculation Document

Progression in the use of manipulatives to support learning (How we support children's concrete understanding of maths)

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Real-life objects	Real-life objects	Mini-whiteboards	Mini-whiteboards	Mini-whiteboards	Mini-whiteboards	Mini-whiteboards
0 – 9 digit cards	0 – 9 digit cards	Place value cards			Protractors	Protractors
Number track/line to 20	Number line to 20 and 50	Number line to 100	Number line to 100	Number line including negative numbers	Number line including negative numbers	Number line including negative numbers
Meter/Counting stick	Meter/Counting stick	Meter/Counting stick	Meter/Counting stick	Meter/Counting stick	Meter/Counting stick	Meter/Counting stick
		Transparent rulers	Transparent rulers	Transparent rulers	Transparent rulers	Transparent rulers
Tens frame	Tens frame and hundred square	Tens frame and hundred square	Tens frame and hundred square	Tens frame and hundred square	Tens frame and hundred square	Tens frame and hundred square
Building blocks	Place value charts – Tens and ones	Place value charts – Ones to hundreds	Place value charts – Ones to Thousands	Place value charts – Ones to Ten thousands	Place value charts to a million and three decimal places	Place value charts to 10 million and three decimal places
Containers that are different shapes and sizes	Containers that are different shapes and sizes	Fraction bars, walls, circles (centralised storage)				
Numicon shapes	Numicon shapes/ Dienes	Dienes	Dienes	Dienes	Dienes	Dienes
Sorting hoops	Sorting hoops	Sorting hoops	Place value counters	Place value counters	Place value counters	Place value counters
Big Dice	Place value arrow cards – tens and ones	Place value arrow cards – tens and ones	Place value arrow cards – H, T, O	Place value arrow cards – H, T, O	Place value arrow cards	Place value arrow cards
Part-part-whole mat	Part-part-whole mat	Part-part-whole mat	Part-part-whole model	Part-part-whole model	Part-part-whole model	Part-part-whole model
Transparent counters	Transparent counters	Transparent counters	Transparent counters	Transparent counters	Transparent counters	Transparent counters
Bar model with real-life objects	Bar model pictorial objects/ representative objects e.g. counters	Bar model with counters /Dienes progressing to numbers	Plastic mirrors	Plastic mirrors	Plastic mirrors	Plastic mirrors
Bead strings – ten	Bead strings – twenty/fifty	Bead strings - hundred	Bead strings - hundred	Bead strings - hundred	Bead strings - hundred	Bead strings - hundred
Dice	Dice	Dice	Dice	Dice	Dice	Dice
Cuisenaire rods	Cuisenaire rods	Cuisenaire rods	Cuisenaire rods	Cuisenaire rods	Cuisenaire rods	Cuisenaire rods
Double sided counters	Double sided counters	Double sided counters	Double sided counters	Double sided counters	Double sided counters	Double sided counters
Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount
Maths balances			Weighing scales			
Solid geometric shapes (centralised storage)						
Coins and notes (centralised storage)						
Clock (geared) (centralised storage)						

Maths Working Wall (How we use displays to support children's understanding of mathematical concepts)		
Build it	Use a real-life representation of the concept, which children can see, touch and feel.	
Draw it	Show a pictorial representation of the concept.	
Solve it	Show the mathematical representation of the concept	$6 \times 2 = 12$ $2 \times 6 = 12$ $12 \div 2 = 6$ $12 \div 6 = 2$ Factors of 12 are: 1, 2, 3, 4, 6 and 12
Practise it	Encourage children to practice the concept. Interactive opportunity – ask children to respond to questions, encourage them to add what they know, leave homework for children to take to master the concept.	$1 \times 2 = 2$ $2 \times 2 = 4$ $3 \times 2 = 6$ etc.
Challenge it	Set a challenge to be solved. Interactive opportunity – leave real-life objects or manipulatives for children to use to help solve the challenge.	How many different ways can 12 eggs be arranged into arrays? What if you try 24 eggs?
Say it	Use vocabulary related to the concept	Multiply, multiplication , repeated addition, array, divide, group, multiples, factors

Progression in the teaching of counting in Foundation Stage

Pre-counting

The key focus in pre-counting is an understanding of the concepts more, less and the same and an appreciation of how these are related. Children at this stage develop these concepts by comparison and no counting is involved

Ordering

Count by reciting the number names in order forwards and backwards from any starting point.

One to one correspondence

One number word has to be matched to each and every object. Lack of coordination is a source of potential error – it helps if children move the objects as they count, use large rhythmic movements, or clap as they count.

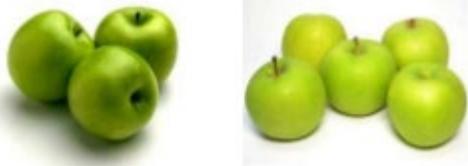
Cardinality (Knowing the final number counted is the total number of objects)

Count out a number of objects from a larger collection. Know the number they stop counting at will give the total number of objects.



Pre-counting ideas

Provide children with opportunities to sort groups of objects explicitly using the language of more and less.



Which group of apples has the most?
Which group of apples has the least?

Ordering ideas

Provide children with opportunities to count orally on a daily basis. Rote count so that children are able to understand number order and can hear the rhythm and pattern. Use a drum or clap to keep the beat.



One to one correspondence ideas

Play counting games together moving along a track, play games involving amounts such as knocking down skittles.



Use traditional counting songs throughout the day ensuring children have the visual/kinaesthetic resources e.g. 5 little ducks, 10 green bottles

Cardinal counting ideas



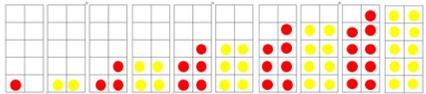
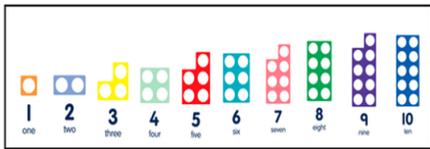
How many bananas are in my fruit bowl? Allow children to physically handle the fruit.

Provide children with objects to point to and move as they count and say the numbers.

Progression in the teaching of counting in Foundation Stage

Subitising (recognise small numbers without counting them)

Children need to recognise small amounts without counting them e.g. dot patterns on dice, dots on tens frames, dominoes and playing cards as well as small groups of randomly arranged shapes stuck on cards.

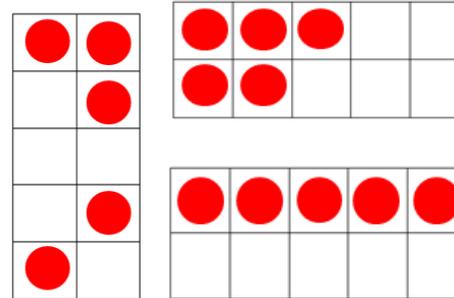


Abstraction

You can count anything – visible objects, hidden objects, imaginary objects, sounds etc. Children find it harder to count things they cannot move (because the objects are fixed), touch (they are at a distance), see, move around. Children also find it difficult to count a mix of different objects, or similar objects of very different sizes.

Conservation of number – MASTERY!

Ultimately children need to realise that when objects are rearranged the number of them stays the same.

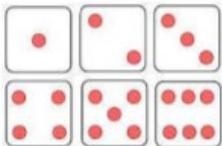
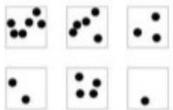
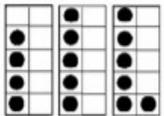


End of year counting expectations

- count reliably to 20
- count reliably up to 10 everyday objects
- estimate a number of objects then check by counting
- use ordinal numbers in context e.g. first, second, third
- count in twos, fives and tens
- order numbers 1-20
- say 1 more/ 1 less than a given number to 20

Subitising ideas

Provide children with opportunities to count by recognising amounts.



Abstraction ideas



How many pigs are in this picture?
Provide children with a variety of objects to count.



Conservation of Number

The amount is "seven" and doesn't change.

