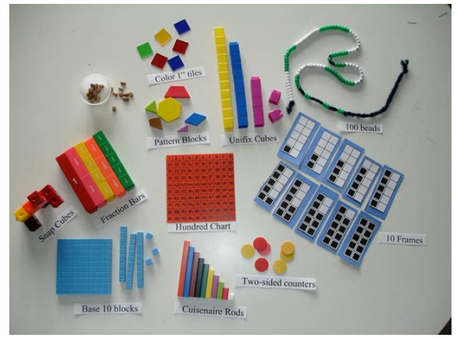
Randlay Primary School & Nursery

EYFS Maths Policy

This policy has created using a wide range of external sources (NCETM, White Rose Maths Hub and Click4teaching). It is a working document and will be revised and amended as necessary. Many variations have been included to provide teachers with a range of tools to support pupils in their grasp of number and calculation. To ensure consistency for pupils, it is important that the mathematical language used in maths lessons reflects the vocabulary used throughout this policy.

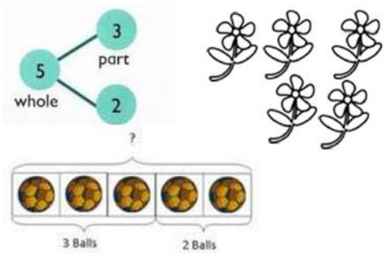
Concrete



The first part of the CPA approach is Concrete, which is known as the 'doing' stage. children use concrete objects to model problems. The CPA approach brings concepts to life by allowing children to experience and handle physical (concrete) objects, unlike traditional maths teaching methods where teachers demonstrate how to solve a problem. With the CPA framework, every abstract concept is first introduced using physical, interactive concrete materials.

As part of the CPA approach, new concepts are introduced through the use of physical objects or practical equipment. These can be physically handled, enabling children to explore different mathematical concepts. These are sometimes referred to as maths manipulatives and can include ordinary household items such as straws or dice, or specific mathematical resources such as dienes or numicon.

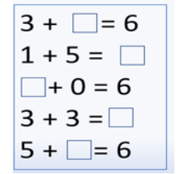
Pictorial



The second part of the CPA approach is pictorial, which is known as the 'seeing' stage. This is when visual representations of concrete objects are used to model problems. children are encouraged to make a mental connection between the physical object they have just handled and the abstract pictures, diagrams or models that represent the objects from the problem.

Building or drawing a model makes it easier for children to grasp difficult abstract concepts (for example, fractions). Once children are confident with a concept using concrete resources, they progress to drawing pictorial representations or quick sketches of the objects. By doing this, they are no longer manipulating the physical resources, but still benefit from the visual support the resources provide.

Abstract



The final stage of the CPA approach is abstract, which is known as the 'symbolic' stage, where children use abstract symbols to model problems. children will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves the teacher introducing abstract concepts (for example, mathematical symbols).

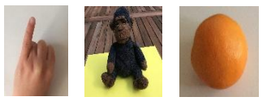
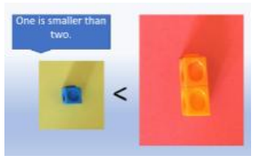
Once children have a secure understanding of the concept through the use of concrete resources and visual images, they are then able to move on to the abstract stage. Here, children are using abstract symbols to model problems – usually numerals. To be able to access this stage effectively, children need access to the previous two stages alongside it.

Concrete, pictorial, abstract (CPA) concepts should not be confused as differentiation for lower, middle, higher attaining children. CPA is an approach to be used with the whole class and teachers should promote each area as equally valid. Manipulatives in particular must not be presented as a resource to support the less confident or lower attaining pupils.

True mastery aims to develop all children's mathematical understanding at the same pace. As much as possible, children should be accessing the same learning. Differentiation should primarily be through support, scaffolding and deepening, not through task. Consistency in language is essential for pupils to understand the concepts presented in mathematics. If other, 'child-friendly' terminology is used, this must be alongside the current terminology recommended by the maths subject leader. Using this will support children with their examinations and throughout secondary school.

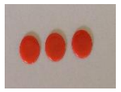
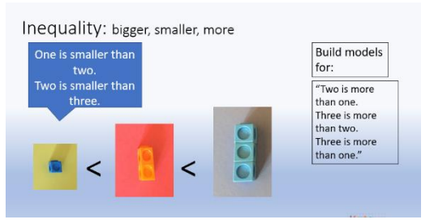
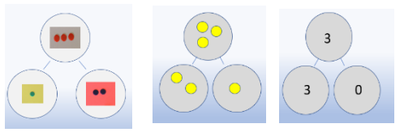
"Children are working towards the Mathematics Early Learning Goals (EYFS 2021), demonstrating understanding of number composition, number bonds, and patterns within numbers to 10."

NURSERY EARLY DEVELOPMENT (Birth–3)	
• *Selects a small number of objects when asked (e.g. 1 or 2)* • *Begins to understand that numbers relate to quantities* • *Shows awareness of small amounts (without counting accurately)* • *Creates marks, symbols, or gestures to represent number ideas* • *Uses own methods to record quantities (e.g. scribbles, dots)*	• *Begins to link marks to meaning* • *Notices differences between groups (more / less)* • *Begins to compare two sets of objects* • *Shows interest in quantity differences* • *Uses early quantity language (e.g. more, a lot)* • *Begins to use number-related words in play* • *Responds to simple mathematical language from adults*

Representations	Key knowledge and vocabulary	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment
    	Concepts of quantity, equality and inequality. Modelling combining sets of small quantities. Modelling adding to a quantity to make it bigger. Removing objects from a set to show the amount is now smaller.	Natural materials and physical objects in all environments. Pictures to show one or two items. Objects and resources to physically represent a quantity. Images and pictures to represent a small quantity. Using dishes/hoops to make quantities of different values that visually show one set has more than the other. Images of quantities to compare. Which has more?	Spoken number names. *One, once, alone, first.* Mark making and graphics to represent a small number in the context of play. Mark making and graphics to represent a small quantity to compare in the context of play.	Wonderful one and terrific two displays. Hiding objects find one of, or lots of in the sand, across the setting. Matching one item to another then to one image. Repeat with two. Snack time: one piece of fruit to one person, two pieces each Problem solving: "We need one/two each how can we sort the bears?"

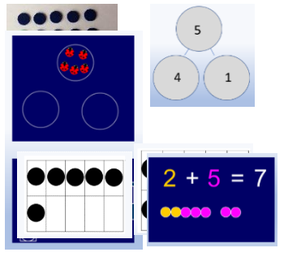
NURSERY (3-4 years)	
• *Knows that numbers tell us how many are in a set* • *Begins to link counting to quantity (cardinality)* • *Represents numbers using fingers, marks, pictures* • *Shows interest in recording numbers* • *Experiments with different ways to show amounts* • *Begins to match numerals to quantities (sometimes accurately)* • *Recognises small numerals in the environment*	• *Compares two groups of objects* • *Identifies when groups have the same number* • *Begins to use comparison language (same, equal)* • *Explores splitting small groups (e.g. 3 or 4 objects)* • *Begins to understand that the total stays the same when regrouped* • *Develops early concept of number conservation* • *Shows curiosity about numbers* • *Engages in number-based play and activities*

Representations	Key Vocabulary	Key knowledge	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment

   	Vocabulary Add, more, and, make, sum, total, altogether, double, how many **Instructional vocabulary:** Listen, join in, say, start from, look at, carry on	Concepts of cardinality, equality, inequality and rearranging the same quantity. Counting to 3. One to one correspondence. Knowing how many are in the set. Comparing numbers 1,2 and 3 – 'bigger' and 'smaller' Stable ordering numbers 1 to 3. 3 is made up of 2 and 1. Using counting strategies and subitising to identify the number of concrete objects in the set.	Natural materials and physical objects in all environments to count. (cardinality) Pictures to show a quantity that can be counted. Use fingers to show small amounts. Images and pictures to represent a small quantity. Resources that match a numeral to a quantity. E.g. a number track, digits cards with numerals and quantities represented.	Represent a quantity by drawing. Mark making and graphics to represent a small quantity and attempts at numerals. Mark making and drawings to replicate the concrete and pictorial model. With models, attempts to write numerals and continue to mark make.	Construction. What can you make with 3 / 4 bricks? Small world. Put three carriages on the train. How many cars are in the car park? How many skittles have you knocked over? Mark making and graphics to represent a small number in the context of play.

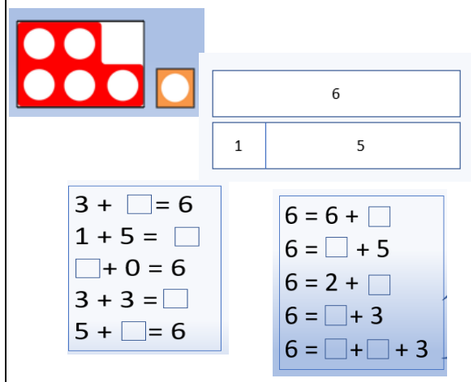
RECEPTION DEVELOPMENT (towards ELG)

- *Counts objects accurately, saying one number name for each item*
- *Counts reliably to 10 and begins to count beyond 10*
- *Understands that the last number counted tells "how many"*
- *Recognises numerals to 5 and then to 10*
- *Matches numerals to the correct quantity*
- *Uses language such as more and fewer*
- *Compares two groups of objects and identifies which has more or fewer*
- *Combines two groups and counts the total*
- *Finds totals by counting all objects*
- *Says the number that is one more than a given number*
- *Begins to understand how numbers increase*
- *Begins to understand taking away in practical contexts*
- *Uses early mathematical vocabulary: add, take away, more, fewer*

Representations	Key Vocabulary	Key knowledge and vocabulary	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment
	**Vocabulary:** Add, more, and, make, sum, total, altogether, double, how many more to make, how many are left, how many have gone? **Instructional vocabulary:** Listen, join in, say, start from, look at, carry on, what comes next, find, choose, talk about	Number structure. Equality, inequality. Partitioning and recombing. Subitising to 5. 5 as an anchor. Modelling the combining of sets, recognising that the quantity has increased. Using counting strategies and subitising to identify the number of concrete/pictorial objects in the set .	Natural materials, physical objects and mathematical resources e.g. counters in all environments to count accurately. (cardinality). To 10 and beyond. Pictures to show a quantity that can be counted then to 10 and beyond. Resources that match a numeral to a quantity Models of mathematical counting resources to show the more or fewer. Using a number track or line to show one more than a given number	Represent a quantity by drawing or by using graphics. (using drawings to show a resource) Mark making and graphics to represent numbers to 10 and beyond in their play. Graphics and attempts at numerals in the correct orientation. Mark making and numerals to replicate the concrete and pictorial model. Graphics and numerals to show the addition	Malleable play: problem solving 'Let's put 5 cherries on the cakes.' 'How will you put your 5 candles on the two cakes?' Role play: problem solving Each shelf in the shop must have 5 or more items to sell. How shall we arrange the items? Find items in the sand. 3 shells and 2 fish. How many items altogether?

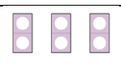
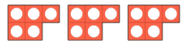
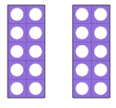
END OF RECEPTION EARLY LEARNING GOALS (EYFS 2021)

- *Counts verbally beyond 20*
- *Understands numbers to 10 in depth*
- *Recognises patterns within numbers*
- *Understands one more and one less relationships*
- *Automatically recalls number bonds to 5 (and some to 10)*
- *Uses number bonds to solve addition and subtraction problems*
- *Solves problems using objects, fingers, and mental strategies*
- *Uses understanding of number relationships rather than just counting*
- *Begins to use more efficient strategies (not just counting all)*
- *Explores and represents patterns within numbers up to 10*
- *Begins to recognise doubling patterns*
- *Shares and groups objects practically*

Representations	Key Vocabulary	Key knowledge and vocabulary	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment
	**Vocabulary:** Add, more, and, make, sum, total, altogether, double, how many more to make, how many are left, how many have gone? One less, two less, ten less, the difference between, odd and even. **Instructional vocabulary:** Listen, join in, say, start from, look at, carry on, what comes next, find, chose, talk about, repeat, tell me, describe, complete	Number structure. Equality, inequality. Partitioning and recombing. Subitising to 5. 5 as an anchor. Modelling the combining of sets, recognising that the quantity has increased. Using counting strategies and subitising to identify the number of concrete/pictorial objects in the set	Natural materials, physical objects and mathematical resources e.g. counters in all environments to count accurately. (cardinality). To 10 and beyond. Pictures to show a quantity that can be counted then to 10 and beyond. Resources that match a numeral to a quantity Models of mathematical counting resources to show the more or fewer. Using a number track or line to show one more than a given number	Represent a quantity by drawing or by using graphics. (using drawings to show a resource) Mark making and graphics to represent numbers to 10 and beyond in their play. Graphics and attempts at numerals in the correct orientation. Mark making and numerals to replicate the concrete and pictorial model. Graphics and numerals to show the addition	Malleable play: problem solving 'Let's put 5 cherries on the cakes.' 'How will you put your 5 candles on the two cakes?' Role play: problem solving Each shelf in the shop must have 5 or more items to sell. How shall we arrange the items? Find items in the sand. 3 shells and 2 fish. How many items altogether?

End of Reception Early Learning Goals (EYFS 2021)

- *Verbally counts beyond 20*
- *Explores and represents patterns within numbers up to 10*
- *Understands one more / one less relationships*
- *Automatically recalls number bonds to 5 (and some to 10)*
- *Uses number bonds to solve addition and subtraction problems*
- *Solves problems using objects, fingers and mental strategies*
- *Explores and represents patterns within numbers up to 10*
- *Begins to recognise doubling patterns*
- *Shares and groups objects practically*

Representations	Key Vocabulary	Key knowledge	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment
Counting in 2s  Counting in 5s   Double 10 is 20.  4 shared equally into two groups.  8 divided in to groups of 2.  To halve the apple it would be cut into two equal pieces	**Vocabulary:** Add, more, and, make, sum, total, altogether, double, how many more to make, how many are left, how many have gone? One less, two less, ten less, the difference between, odd and even. Equals, share, groups of, halve and half **Instructional vocabulary:** Listen, join in, say, start from, look at, carry on, what comes next, find, choose, talk about, repeat, tell me, describe, complete, pattern, remember, ring, work out, check, another way	Knowing that groups of the same quantity are added together. That is what makes a double. The quantity divided into two equal groups. Halving. Sharing and grouping. Sharing is where you take a quantity and count out into how many equal groups you want. Grouping is where you take the quantity and make the groups (of two, or three etc)	Natural materials, physical objects and mathematical resources e.g. counters in all environments to double, share, group and half accurately. Modelling and demonstrating groups of and shared quantities. Showing that the quantity has increased when doubled and reduced when halved.	Represent a quantity by drawing or by using graphics. (using drawings to show a resource) Graphics and numerals to show the double/halving/grouping and sharing used.	In small world play: All the animals in the enclosures are doubles. How many lions will there be etc? Doubles shop Everything in the shop has to be double. Snack time How will we share the fruit so that we can have half each?

To halve the satsuma we would count the segments and share them equally.  Double the number of ladybirds.					