



# Dean Field Community Primary School

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## Calculation Methods

### EYFS

This booklet contains the calculation methods used in EYFS. There are lots of examples to help you support your child with the four C's at home. They are comparison, counting, composing and change.

Please use this document as a tool to support your child at home. The methods we use in school may or may not be familiar to you. Children can become confused when they seek support from an adult at home because often, the adult will teach the method they, themselves were taught. Knowing how the methods in this booklet work will help you to help your child. All staff in school use this document so that we can ensure the consistency of our approach.

## Comparison

Skill	Small focus	Potential difficulties	Possible teaching strategies
<p><u>Vocabulary</u></p> <ul style="list-style-type: none"> <li>Comparing the size of quantities (by looking at the quantity of objects, not their size or orientation)</li> </ul>	<ul style="list-style-type: none"> <li>Recognise when two <b>quantities</b> different by saying;                             <ul style="list-style-type: none"> <li>- Which of two <b>quantities</b> is more</li> <li>- Which of two <b>quantities</b> is fewer</li> </ul> </li> <li>Recognise when two <b>quantities</b> are the same</li> </ul>	<ul style="list-style-type: none"> <li>Refers to any number of objects more than one as 'lots'</li> <li>Assumes that the amount of space taken up by a group of objects relates to the overall quantity, e.g. thinks that a row of five large objects is more than a row of eight small objects</li> <li>Fails to recognise that a group of four apples contains the same number as a group of four peas</li> <li>Is insecure with the language of comparison, e.g. can say 'Pradeep has more shells than Jo' when Pradeep had five and Jo has three, but not 'Jo has fewer than Pradeep'</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that children have frequent opportunities to compare sets of objects of different sizes.</li> <li>Provide opportunities for children to recognise small groups as equal / same even when arranged differently or spread out</li> <li>Give children strategies for comparing the number of objects in different groups, e.g. pairing dissimilar objects from each set of counting objects in each set</li> <li>Model the language of comparison in everyday situations and ensure children are asked to identify who has fewer as well as who has more and encourage children to use the corresponding language</li> </ul>
<p><u>Estimation</u></p> <ul style="list-style-type: none"> <li>Make a reasonable estimation (sensible guess) of a number of objects without counting</li> </ul>	<ul style="list-style-type: none"> <li>Recognise if the quantity in a set is known (subitised) or unknown</li> <li>Recognise known images within a quantity and use to support estimation (structured arrangement)</li> </ul>	<ul style="list-style-type: none"> <li>Believes that an estimation has to match the exact number of objects</li> <li>Makes wild estimates, e.g using favourite large numbers</li> </ul>	<ul style="list-style-type: none"> <li>Make every day examples of estimation used in all areas of learning explicit- 'do you think we've got enough cups?'</li> <li>Do not ask children to estimate objects that they can subitise or count very quickly</li> </ul>

	<ul style="list-style-type: none"> <li>Recognise known images within a quantity and use to support estimation (random arrangement)</li> </ul>		<ul style="list-style-type: none"> <li>Ask children to estimate mixed steps of objects, sounds (e.g. shake a tin can containing coins) and objects they can't easily see (e.g. the number of objects in a pencil case)</li> <li>Model estimation strategies for children e.g. 'do you think there are more or fewer than 10?'; ensure they have opportunity to build experience, for example, collecting sets of ten objects and using these as a benchmark when making other estimates.</li> </ul>
<u>Prediction</u> <ul style="list-style-type: none"> <li>Predict the number that comes after or before in a number rhyme or problem</li> </ul>	<ul style="list-style-type: none"> <li>Recognise if a number rhyme, story or problem is increasing</li> <li>Recognise if a number rhyme, story or problem is decreasing</li> </ul>	<ul style="list-style-type: none"> <li>Doesn't link the rhyme with being a number problem</li> <li>Can't identify if the number rhyme/ problem has increased or decreased in quantity</li> <li>Predicts one more rather than one less (fewer)</li> <li>Predicts one less (fewer) rather than one more</li> </ul>	<ul style="list-style-type: none"> <li>Sing familiar number rhymes with the children using props and/ or fingers and/ or numerals to help aid their understanding</li> <li>Use real life examples of number problems solving as they arise in children's play where they can predict the answer</li> </ul>
<u>Ordering</u> <ul style="list-style-type: none"> <li>Order numbers (quantities, numerals and mixed representations)</li> </ul>	<ul style="list-style-type: none"> <li>Identify the smallest quantity to start with</li> <li>Identify the largest quantity to start with</li> <li>Identify zero to start with</li> </ul>	<ul style="list-style-type: none"> <li>Has to count from 1 to find the number before or after a given number as they are insecure when counting from other starting numbers</li> <li>Is unable to identify a missing number within a given range</li> </ul>	<ul style="list-style-type: none"> <li>Give children experience of counting from different starting points, both forwards and backwards</li> <li>Provide children with partially completed number tracks, e.g. 1, , , ,5, to give them experience of identifying which number goes</li> </ul>

		<ul style="list-style-type: none"> <li>• Confuses the number that comes before and after a given number, e.g. saying four comes before three rather than after three</li> <li>• Confuses the language of ordering numbers, e.g says 'six comes behind seven'</li> </ul>	<p>before or after given numbers.</p> <ul style="list-style-type: none"> <li>• Provide children with a selection of numbers or numerals to order on an empty track e.g 2, 5, 9, 10</li> <li>• Provide images of objects, e.g. images of the spots on a dice, and ask children to order these and identify the image that comes before or after</li> <li>• Order combination of numbers and numerals</li> </ul>
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## Counting

Skill	Small focus	Potential difficulties	Possible teaching strategies
<p><u>Verbal counting</u></p> <ul style="list-style-type: none"> <li>• Know the number names in order</li> <li>• Chanting forwards and backwards in ones</li> <li>• Recognising a chanting sequence</li> </ul>	<ul style="list-style-type: none"> <li>• Practise chanting forwards from zero</li> <li>• Practise counting from number to zero</li> <li>• Recognise if a chanting sequence is increasing or decreasing</li> <li>• Practise chanting forwards from any starting point</li> <li>• Practise chanting backwards from any starting point</li> </ul>	<ul style="list-style-type: none"> <li>• Doesn't separate the number names but says 'onetwothreefour...' as if one word</li> <li>• Misses out number names, e.g. one, two, three, five, six</li> <li>• Repeats number names, e.g- one, two, two, three, four</li> <li>• Uses the correct number names but in the wrong order, e.g one, two, three, four, six, five</li> <li>• Recites accurately the number names when starting from one or zero but has difficulty counting from other starting</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage children to rehearse number names and order using songs, games, books and rhymes</li> <li>• Give children experience of chanting in different starting points, both forwards and backwards changing the pace of chanting</li> <li>• Encourage children to spot the mistake a puppet makes when chanting and to teach the puppet how to chant correctly</li> <li>• Ensure that the children have frequent opportunities to cross tens boundaries in chanting</li> </ul>

		<p>numbers and when counting backwards</p> <ul style="list-style-type: none"> <li>• Confuses two sequences e.g- ten, eleven, twelve, thirty, forty, fifty, sixty, seventy, eighty, ninety</li> <li>• Confuses the vocabulary of counting 'backwards', 'forwards', 'up', 'down', 'on', 'back from', etc. and counts in the wrong direction</li> </ul>	<p>activities, rhymes and games</p> <ul style="list-style-type: none"> <li>• Use a large number track on the floor, which children can jump along while chanting forwards and backwards</li> <li>• Consider horizontal and vertical prompts to support chanting.</li> </ul>
<p><u>Subitizing</u></p> <ul style="list-style-type: none"> <li>• Recognise small numbers (&lt;3 or 4) of objects without counting</li> </ul>	<ul style="list-style-type: none"> <li>• Recognising a small quantity where all the object are the same</li> <li>• Recognising a small quantity where a variable differs between objects</li> <li>• Recognise a small quantity where all objects are different</li> </ul>	<ul style="list-style-type: none"> <li>• Can only subitise when objects are arranged in familiar patterns</li> <li>• Finds it difficult to subitize when objects are different colours, size or shape</li> <li>• Relies on counting small number of objects even when they could recognise how many there are</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage instant recognition of one, two or three dots by providing dice, playing cards and dominoes for the children to include in their play</li> <li>• Put small numbers of objects in unfamiliar patterns and compare with familiar patterns, such as spots on dice and dominoes</li> <li>• When children subitise correctly, accept their responses rather than insisting that they check by counting</li> <li>• Encourage children to visualise common familiar patterns, e.g looking closely at the arrangements of dots on a dice, talking about what they can see, then hiding the dice and asking children to recreate the pattern</li> </ul>

<p><u>Recognising</u></p> <ul style="list-style-type: none"> <li>Identifying number representations, including numerals</li> </ul>	<ul style="list-style-type: none"> <li>Introduce familiar, structured representations (dice and ten frames etc.)</li> <li>Using marks, begin to record own representations of numbers</li> <li>Identify familiar patterns of up to six objects</li> <li>Introduce numerals in different sizes and fonts shown alongside number images</li> <li>Represent numbers using fingers</li> <li>Identify numerals in isolation</li> <li>Match numeral to a correct number representation</li> <li>Begin to form numerals</li> <li>Knows that objects can be counted in any order, from any starting point, as long as every item is counted once (Order irrelevance principle)</li> <li>Identifies that the number associated with the last object touched is the total number of objects (Cardinal principle)</li> <li>Know that zero is the cardinal</li> </ul>	<ul style="list-style-type: none"> <li>Does not coordinate number names with items being counted</li> <li>Coordinates number names with items counted but misses out one or more of the objects</li> <li>Coordinates number names with items counted but counts an object more than once</li> <li>Does not associate the number names said with the number of objects counted</li> <li>Does not realise that the last number in a count is the number in the set</li> <li>When asked for the total in a collection that they have just counted, counts the whole set again</li> <li>Loses track when counting objects that are randomly arranged, or that cannot be touched</li> <li>Loses track when counting sounds</li> </ul>	<ul style="list-style-type: none"> <li>Model touch counting each object as you say a number</li> <li>Use 2D and 3D shape features as counting opportunities</li> <li>Model counting objects systematically, e.g. point to one at a time from top to bottom, left to right</li> <li>Remember to vary and mix resources that children are counting</li> <li>When counting objects, discuss with the children what they could do to make counting easier, e.g. put them in a line or familiar representation, move them as we count, lace into a structured scaffold (ten frame/ Hungarian ten frame)</li> <li>Use tidy up time to reinforce counting objects</li> <li>Count things that can be seen but not touched, e.g. model pointing at pictures on the wall to count how many there are</li> <li>Model how you can cover static objects with counters to help keep track of what has been counted</li> <li>Count sounds, e.g. drop coins</li> </ul>
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	<p>value of an empty set</p> <ul style="list-style-type: none"> <li>Count out a smaller number of objects from a larger group</li> <li>Count objects that cannot be moved (Abstract principle)</li> <li>Count actions or sounds (Abstract principle)</li> <li>Knows that zero is a place holder</li> </ul>		<p>into an empty tin at irregular intervals to encourage children to wait for each sound before it is counted.</p> <ul style="list-style-type: none"> <li>Appreciate that numbers can identify how many objects are in a set</li> <li>Know that the last number in the count gives the total</li> </ul>
<p><u>Ordinal and Nominal</u></p> <ul style="list-style-type: none"> <li>Using ordinal numbers</li> </ul>			<ul style="list-style-type: none"> <li>Use first, second and third in practical contexts</li> <li>Use in a range of contexts</li> <li>Make number books that have meaning for the children, such as favourite numbers, birthdays or telephone numbers</li> </ul>

### Composition

Skill	Small Focus	Potential Difficulties	Possible Teaching Strategies
<p><u>Part-Whole relationships</u></p> <ul style="list-style-type: none"> <li>Understanding the connection between an object and how it might be split</li> </ul>	<ul style="list-style-type: none"> <li>Understand that a whole can be one object and if some of it is removed, it is no longer the original whole</li> <li>Understand that if a whole is split the new parts are smaller than the original whole</li> <li>Understand the smaller parts can be put back together to make the original whole</li> </ul>	<ul style="list-style-type: none"> <li>Children might think that parts must be equal</li> </ul>	

	<ul style="list-style-type: none"> <li>Understand that a group of objects can represent a whole (unitising)</li> </ul>		
<u>Numbers within Numbers</u> <ul style="list-style-type: none"> <li>Knowing that each number builds upon the previous number</li> <li>Knowing that a number can be partitioned into smaller numbers</li> <li>Knowing numbers can be combined to form a larger number</li> </ul>	<ul style="list-style-type: none"> <li>Show a number as the previous number plus one (Number System)</li> <li>Understand that a number can be partitioned into smaller quantities (Decomposition)</li> <li>Understand that quantities can be combined to make a number (Composition)</li> </ul>		<ul style="list-style-type: none"> <li>Give children plenty of experience of finding for themselves that the total number of objects stays the same (Conservation of Number)</li> <li>Use bead-strings to support</li> <li>Use fingers to represent a number in different ways</li> <li>Use bunny fingers (fingers on top of your head) when asking children to show quantities on their fingers</li> <li>Begin to use marks to record their understanding</li> <li>Use this opportunity to raise awareness of doubles and halves</li> <li>A PPW model may be useful</li> </ul>
<u>Conceptual Subitizing</u> <ul style="list-style-type: none"> <li>Recognise a quantity as a whole from know or subitized parts</li> </ul>	<ul style="list-style-type: none"> <li>Know a structured representation of a whole by describing two parts</li> <li>Know a structured representation by describing what is absent</li> <li>Recognise or subitize quantities</li> </ul>		<ul style="list-style-type: none"> <li>Provide children opportunities to make numbers on structured scaffolds such as Ten Frames or Hungarian Frames. Discuss the composition of the numbers</li> <li>Encourage children to find known representations of numbers in familiar</li> </ul>

	<p>in unstructured arrangements</p> <ul style="list-style-type: none"> <li>Recall know number facts to identify whole in an unstructured arrangement</li> </ul>		<p>manipulatives, such as laying cards and dominoes</p> <ul style="list-style-type: none"> <li>To support children, use a different coloured to distinguish a known representation in an unstructured arrangement</li> </ul>
<p><u>Unitizing and Making Ten</u></p> <ul style="list-style-type: none"> <li>Rename a group of objects as one unit</li> </ul>	<ul style="list-style-type: none"> <li>Collect together a set of objects and rename as one unit</li> <li>Know that multiple units must have the same amount in each</li> <li>Count number of units</li> <li>Know teen numbers as one unit of ten and...</li> </ul>	<ul style="list-style-type: none"> <li>When making a unit the children still see the number as how many are in the group rather than see the group as 1 unit</li> <li>Children counting all objects not counting the units</li> </ul>	<ul style="list-style-type: none"> <li>Use familiar units e.g pairs of socks, shoes</li> <li>Provide lots of opportunities for the children to unitize smaller numbers within their play, not us making groups of 10, e.g. 3 sweets in each bag, 6 pieces of pasta in each bowl, 8 flowers in each bunch etc.</li> </ul>

### Change

Skill	Small Focus	Potential Difficulties	Possible Teaching Strategies
<p><u>Combining Sets</u></p> <ul style="list-style-type: none"> <li>Understand that adding can be the change of sets into one new group (Aggregation)</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that sets can be combines to make a new group</li> <li>Recognise when a contextual problem is following this addition structure</li> <li>When needed, generate a collective noun for the new combined group</li> <li>Represent the sets from a contextual problem using manipulatives</li> <li>Use the vocabulary of addition when combining the sets into a new group</li> </ul>	<ul style="list-style-type: none"> <li>Some children may not be able to identify a collective noun to combine the sets under</li> </ul>	<ul style="list-style-type: none"> <li>Always use context for partitioning</li> <li>Use proper to enhance number stories</li> <li>Remember to use similar categories, e.g. I have five fruit. Three are apples, how many are pears?</li> <li>If the total is below 4, allow children to subitize. There is no need for them to count.</li> <li>Encourage children to count all objects in the new group to find the total, if it is 5 or above</li> </ul>

	<ul style="list-style-type: none"> <li>• Find the total quantity of a new group by using a strategy</li> <li>• Know the new group is a larger quantity than either of the original sets</li> <li>• Begin to use marks to record their understanding of aggregation</li> </ul>		<ul style="list-style-type: none"> <li>• When children are ready, promote the idea of counting on from one of the sets. Support this idea with the use of familiar structured representations. Objects within a set could be covered or replaced with numerals.</li> <li>• Encourage children to count on from the set with the largest quantity as an effective strategy</li> <li>• Vary types of question to include missing number problems. Scaffold this by showing the scenario with props and then covering a set over</li> <li>• Make explicit the link between one more and adding one</li> </ul>
<p><u>Separating Sets</u></p> <ul style="list-style-type: none"> <li>• Understand that subtraction can be the change of a group by separating a set to identify what is remaining (Partition)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that a group can be separated into sets</li> <li>• Recognise when a contextual problem is following this subtraction structure</li> <li>• Give the separated sets and remaining set each a noun</li> <li>• Represent the group from a contextual problem using manipulatives</li> <li>• Use the vocabulary of</li> </ul>		<ul style="list-style-type: none"> <li>• Always use a context for partitioning</li> <li>• Use props to enhance number stories</li> <li>• Remember to use similar categories, e.g I have five fruit. Three are apples. How many pears?</li> <li>• If hat is remaining is below 4, allow children to subitize. There is no need for them to count</li> </ul>

	<p>subtractions when separating a set from the group</p> <ul style="list-style-type: none"> <li>• Find the quantity of the remaining sets by using a strategy</li> <li>• Know that both of the sets are smaller quantities than the original group</li> <li>• Begin to use marks to record their understanding of partitioning</li> </ul>		<ul style="list-style-type: none"> <li>• Encourage children to count what is remaining, if it is 5 or above</li> <li>• When children are ready, promote the idea of counting back. Scaffold this using structured frames</li> <li>• Vary types of question to include missing number problems. Scaffold this by showing the scenario with props and then covering a set over</li> <li>• Make explicit the link between one fewer and subtracting one</li> </ul>
<p><u>Increasing a Set</u></p> <ul style="list-style-type: none"> <li>• Understand that adding can be the change of an existing set by increasing its quantity (Augmentation)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognising that if objects are added to an existing set, the quantity has increased</li> <li>• Recognise when a contextual problem is following this addition structure</li> <li>• Represent the set from a contextual problem using manipulatives</li> <li>• Use the vocabulary of addition when increasing the set</li> <li>• Find the new total quantity of the sets by using strategy</li> <li>• Know the group is now a larger quantity than the original group</li> </ul>	<ul style="list-style-type: none"> <li>• When counting on from a given number, includes the given number in their counting</li> <li>• Can count on but does not understand how to apply this to addition</li> <li>• Counts on in ones but does not use this as a method</li> <li>• Can count on but does not understand how to apply this to addition or the combining of two or more groups of objects, resorting to counting all</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that one more is an increase in the number sequence</li> <li>• Always use a context for augmentation using 'first', 'then' and 'now' as prompts</li> <li>• Use props to enhance number stories</li> <li>• If the total is below 4, allow children to subitize. There is no need for them to count</li> <li>• Encourage children to count all of the objects to find the total, if it is 5 or above</li> <li>• When children are ready, promote the idea of counting on</li> </ul>

	<ul style="list-style-type: none"> <li>• Begin to use marks to record their understanding of augmentation</li> </ul>		<p>from the existing set. Support this idea with the use of familiar structured representations. Objects within the existing set could be covered or replaced with numerals</p> <ul style="list-style-type: none"> <li>• Vary types of questions to include missing number problems. Scaffold this by showing the scenario with props and then covering a set over</li> </ul>
<p><u>Decreasing a Set</u></p> <ul style="list-style-type: none"> <li>• Understand that subtraction can be the change of an existing set by decreasing its quantity (Reduction)</li> </ul>	<ul style="list-style-type: none"> <li>• Recognising that if objects are removed from a set, the quantity has decreased</li> <li>• Recognise when a contextual problem is following this subtraction structure</li> <li>• Represent the set from a contextual problem using manipulatives</li> <li>• Use the vocabulary of subtraction when removing from the set</li> <li>• Find the reduced quantity of the set by using a strategy</li> <li>• Begin to use marks to record their understanding of reduction</li> </ul>	<ul style="list-style-type: none"> <li>• When counting back from a given number includes the given number in their counting</li> <li>• Can count back but does not understand how to apply this to subtraction</li> <li>• Count backs in ones but does not use this to subtract</li> </ul>	<ul style="list-style-type: none"> <li>• Counting back to subtract</li> <li>• Make link between one fewer and subtraction one</li> <li>• Recognising that if objects are removed from an existing set the quantity changes</li> <li>• Recognise that one fewer is a decrease in the number sequence</li> <li>• Always use a context for reduction using first, then and now as prompts</li> <li>• Use props to enhance number stories</li> <li>• If what is remaining is below 4, allow children subitize, there is no need to count</li> <li>• Encourage children to count what is remaining if is if 5 or</li> </ul>

			<p>above</p> <ul style="list-style-type: none"><li>• When children are ready promote the idea of counting back, scaffold this using structured frames</li><li>• Vary types of question to include missing number problems, scaffold this by showing the scenario with props and then covering a set over</li><li>• Make explicit the link between 1 fewer and subtracting one</li></ul>
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