# Calculations policy


*Independent Learners for Life*

*whatever it takes*

Reception

## Early Learning Goal

Count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

### Pre-requisite skills

**Understanding number, developing number sense, counting and estimating**

- Begin to identify own mathematical problems based on own interests.
- Talk about the mathematics they are doing, using number names and number language spontaneously in play
- Recognise and talk about simple patterns in the environment
- Begin to represent numbers/quantities using fingers, objects, marks on paper
- Sort and match objects by shape, colour, size or other common property
- Pair objects 1-1 and begin to use the language 'as many as', 'the same as', 'more than', 'fewer than' in context.
- Compare 2 groups of objects, identifiying when they are the same
- Order a set of objects by length, height or size, using positional language such as 'next to', 'after', 'before', 'between' and language of measurement 'longer/taller/bigger/shorter/smaller than'.
- Count with 1-1 correspondence to at least 5 objects
- Know that:
    - the last number said in a count identifies how many objects are in a set
    - the total number of objects in a set remains the same no matter which order they are counted
- Count forwards and backwards to at least 10 and beyond.
- Finds the total number of items in two groups by counting all of them.
- Count out a specified number of objects from a collection
- Recognise the Numicon shapes for 1-10 without counting the holes
- Recognise and name numerals 1-5
- Select the correct numeral to represent 1-5, then 1-10 objects
- Match numerals 1 to 10 with structured imagery e.g. Numicon shapes, ten frames or dice patterns.
- Represent numerals to 10 using structured imagery e.g. Numicon shapes and patterns on ten frames
- Say and use number names in order
- Arrange objects into structured patterns e.g. pair-wise patterns when counting objects
- Develop strategies for reliable counting such as counting from one set to another or arranging in pair wise patterns
- Use the language of more/less to compare 2 sets of objects and then numerals
- Identify the number after any number up to 9

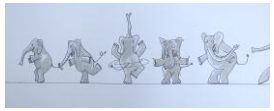
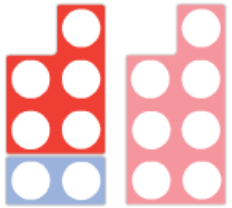
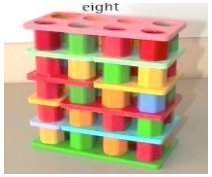
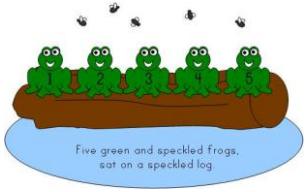
### Associated skills

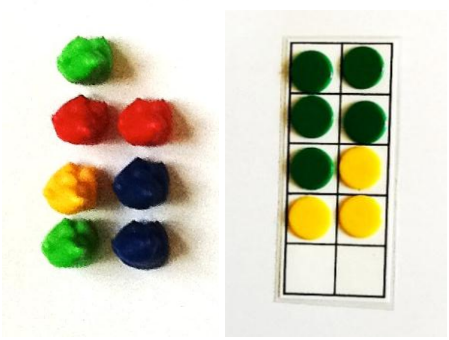
**Understanding number, developing number sense, counting and estimating**

- Recognise that numbers can be used in different ways and have experience of numbers beyond their number range in context
- Count with 1-1 correspondence reliably to 10 then 20 objects, using strategies such as arranging in pair-wise patterns either making Numicon patterns or placing objects in tens frames
- Count forwards and backwards to 30.
- Counts actions or objects which cannot be moved.
- Recognize quantities up to 4 without counting (subitising)
- Use ordinal numbers in different contexts
- Recognise patterns within the number system up to 20 e.g. that the next number in the counting sequence is 1 more than the last number; that teens numbers follow the same patterns as numbers up to 10.
- Sort a variety of objects according to given criterion and then to own criterion
- Recognise, name and write numerals to 10 (then 20).
- Begin to generalise in relation to number e.g. use number names as nouns and not just adjectives "3 and 5 equals 8', instead of 3 sweets and 5 sweets equals 8 sweets'?
- Recognise, name and make teens number using apparatus e.g. Numicon 10 and appropriate unit.
- Can make a reasonable estimate of how many objects they can see and checks by arranging in a Numicon pattern.
- Using a benchmark as a guide, suggest a reasonable estimate for a collection of objects the total of which is within the child's number range
- Record mathematical tasks informally using numerals, diagrams, Numicon shapes/patterns or other structured images
- Compare and order numerals to 10 (then 20) using appropriate language e.g. more/less, bigger/smaller
- Use language greater, smaller, heavier, lighter to compare 2 quantities
- Compare and order numbers to 10 using appropriate language e.g. more/less, bigger/smaller
- Find 1 more/less than a number from 1-10

**Number facts**

Demonstrate part/whole knowledge of numbers up to 10, e.g. by using Numicon shapes to show ways of making 7.
Begin to develop mental recall of part/whole relationships of numbers up to and including 5, then up to and including 10

| ADDITION | OPPORTUNITIES FOR PROBLEM SOLVING | SUBTRACTION |
|---|---|---|
| Addition calculations in EYFS should always be context led<br><br>Sing counting songs such as One Little Elephant<br><br>  <br><br>When using apparatus, show an awareness that numbers can be combined to make a larger one.<br><br>Combine Numicon shapes with a total no greater than 10 and say the total without counting.<br>  <br><br>Build number bonds using Numicon shapes and identify the different ways of making any number up to and including 10.<br>  <br><br><br>When finding the total of 2 groups of objects, arrange in pair-wise patterns e.g. Numicon patterns or ten frames | Separate a group of up to 4 objects in different ways, beginning to recognize that the total stays the same<br><br>Partition numbers in different ways - Use Numicon to explore different ways of making a number e.g. making 8 using a 3 and a 5, or a 4, 3 and 1.<br><br>When playing skittles/target games, talk about how many skittles are standing up and how many have been knocked down, or how many bean bags went in the bucket and how many didn't. represent this in different ways – Numicon shapes, ten frames, fingers on hands<br><br>  <br><br>Use the language of arithmetic in a number story e.g. more, take away, makes, altogether, left, equals etc)<br><br>Know when to use addition in everyday contextual situations and when solving mathematical problems.<br><br>Know when to use subtraction in everyday contextual situations and when solving problems.<br><br>Use Numicon shapes and patterns to develop understanding of the relationship between addition and subtraction, e.g. 5 and 3 makes 8 and 8 take away 3 leaves 5.<br><br>Make a reasonable estimate for the total number of objects in a collecton. If we put the 6 blue pencils with the 8 red pencils, do you think there will be more or fewer than | Subtraction calculations in EYFS should always be context led<br><br>Sing counting songs such as Five Little Speckled Frogs<br><br>  <br><br><br>Identify different Numicon patterns within Numicon shapes e.g. see the 4 pattern and 3 pattern within the 7 shape.<br><br>  <br><br>When using apparatus, show an awareness that subtraction from a number results in a smaller number.<br><br>Tell own subtraction stories prompted by classroom activities e.g. use small world people to tell a story about children playing in a playground.<br><br>  <br>8 take away 3 = 5<br>3 less than 8 = 5<br><br>Recognise subtraction in stories involving partitioning and decrease (take |



Tell own addition stories prompted by classroom activities e.g. use small world people to tell a story about children playing in a playground.

Identify different combinations of objects to to match a given total e.g. 3 cows and 2 pigs or 1 cow and 4 pigs in a pen, arranging 5 ladybirds on 2 leaves

Recognise addition in stories involving the addition structures of 'altogether' and 'increase'.

*'There are 4 blue buttons and 3 red buttons in this box. That makes 7 buttons altogether"*

*"Jenny has 5 sweets and Zara gives her 3 more. Now she has 8 altogether."*

Demonstrate and respond to addition stories by choosing the appropriate Numicon shapes, saying the number sentence and identifying the total without counting.

Respond to addition questions by combining Numicon shapes and saying the total without counting using the appropriate language of addition e.g '3 more than 6 is 9'.

Show with apparatus that addition can be done in any order.

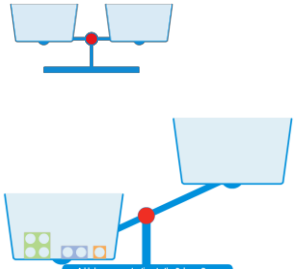
4 + 3 = 3 + 4

10…… more or fewer than 20?

Grab a handful of Numicon pegs. Estimate how many. Check by placing pegs onto tens frame or Numicon tens. Grab two handfuls of pegs. Estimate how many altogether.

Use a pan balance with Numicon shapes to explore addition and subtraction

Choose some shapes to put in each pan to make the scales balance



Which shapes will make the scales balance? Can you find another way?

One child chooses some shapes to put in one pan. Partner has to find different shapes for the other pan to make the scales balance. Ensure children can use the appropriate language before suggesting recording.

NRICH activities:

## Number Rhymes

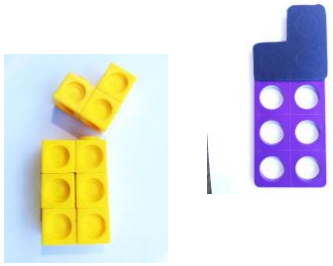
## Maths Story Time

away).

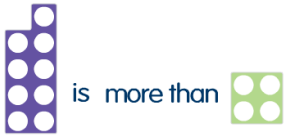
*There were 7 crocodiles in the river. 3 climbed out on to the bank. That left 4 in the river.*

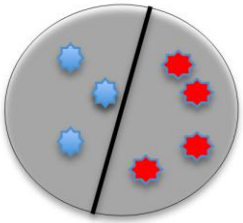
*Baby Bear had 7 sweets but Mummy Bear ate 3 of them. Now he's got 4 sweets left.*

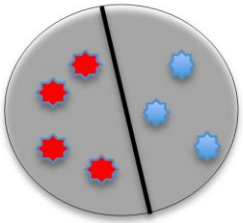
Respond to the subtraction structures of partitioning and decrease (take away/fewer) in stories using either a subtraction cover, by covering the appropriate holes on a Numicon shape with fingers or partitioning linking cubes.



Use Numicon to compare 2 numbers e.g. 6 is greater/more than 4.







The difference between 8 and 5 is 3
How many more than 5 is 8?

Use Numicon to show the numerical difference between 2 numbers

8 is 3 more than 5.

Demonstrate and respond to subtraction stories by choosing the appropriate Numicon shape and identifying the answer without counting.

My pencil case has 5 blue and red pencils. If 3 of my pencils are blue, how many are red?

Jason baked 6 buns and gave 4 to his friends. Now there are 2 left

Respond to subtraction questions such as What is 5 take away 3?" and 'Can you show me 2 less than 7 with Numicon?" using the appropriate shapes. Identify the answer using the appropriate language of subtraction e.g '3 less than 5 is 2 and without counting back in ones.

Notes;
In EYFS, children record their calculations informally using diagrams, words and numerals. Formal recording of calculations e.g. number sentences such as 4 + 3 = 7and 8-5=3 should only be introduced once children have demonstrated all of the skills in the addition and subtraction sections above through action (e.g. using concrete resources), use of the appropriate language and informal recording.

**MULTIPLICATION AND DIVISION**

Year group **RECEPTION**

| **Early Learning Goals**<br>Can recognise create and describe patterns<br>Solve problems, including doubling, halving and sharing | Non statutory guidance |
|---|---|
| **Pre-requisite skills**<br>• Can sort and match objects and pictures<br>• Can separate a group of objects in different ways (eg find different ways of making 7)<br>• Can count in 1's to 10<br>• Can order numbers to 5 | **Associated skills**<br>• Can count in 1's to 20 and then 30<br>• Can order numbers to 10 then 20<br>• Rote count in 2s, 5s and 10s and link to counting repeated groups of the same size e.g pairs of socks, fingers on one hand, fingers on 2 hands, or corresponding Numicon shapes<br>• Can say the number 1 more/1 less than a given number within number range<br>• Use objects to add/subtract 2 single digit numbers<br>• Can recognise when groups of objects are not equal eg one is more than the other.<br>• Recognise and explain simple repeating patterns in the environment, including shape, colour (e.g. ab, ab) |

**Number facts**

| MULTIPLICATION | OPPORTUNITIES FOR PROBLEM SOLVING | DIVISION |
|---|---|---|
| Sort objects into equal groups of 2's, 3's.<br>Put animals in 2's to go into the Ark, socks/shoes in pairs, find sets of 4 wheels to make toy cars, find sets of Numicon shapes, find sets of 6 objects to fill egg boxes<br><br>  *Can you sort the socks into pairs? How many pairs do we have?*<br><br>*Let's see if we have enough wheels to make 3 cars* | Practical problems involved groups and sharing incorporated into continuous provision and daily routines as well as specific focused maths activities e.g. arranging 5 spots on each ladybird or 3 ladybirds on each leaf., filling 3 egg boxes with eggs., sharing milk at break time.<br>Recording is child led/initiated | Can recognise when groups are equal<br><br>  *Can we share these cakes fairly? How would we do this? How do we know if it's fair?* |

<table>
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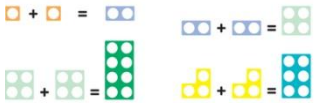
<td>Understands doubling as 2 groups of the same<br><br>  <br>  <br>  <br><br>Link to stories/songs such as The animals went in 2 by 2 or games involving throwing 2 dice: ‘You got double 4. How many jumps can you make?’</td>
<td rowspan="3">Show relationship between doubling and halving using a variety of apparatus<br>  <br>Double 3 is 6. Half of 6 is 3</td>
<td>Respond to instructions relating to sharing and grouping:<br>‘If we share these 6 biscuits between 3 children, how many biscuits will each child get?<br><br>Can you share the cherries so that everyone gets 3 cherries each?<br><br>  </td>
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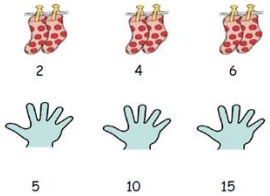
<td> 

<br>Count objects in 2s, 10s and then 5s pairs of socks/shoes, hands. Link to finding out how many in a group e.g. how many fingers altogether when each child holds up both hands.</td>
<td>Understand halving as sharing equally in 2 groups<br><br>Here are 6 sheep in a pen. Can you put half in the field and leave the rest in the pen</td>
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<td>Can recognise when a shape/cake is not divided in 2 equally for example, one piece is bigger than the other.<br><br>  <br><br>Are the pieces of cake equal? Which is the biggest piece?</td>
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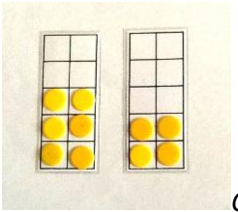
</table>

| | | |
|---|---|---|
| | | Make an unequal group of objects equal<br>  <br>*There are some bears playing in the sandpit and some bears playing on the swings. Can you make it so that there is the same number of bears playing in the sandpit and on the swings?*<br>  <br>*Can you move a counter so that there is the same number of counters on each ten frame ?* |

**Additional resources**

**White Rose Maths** - fluency, reasoning, problem solving whiterosemaths.com

**Numbots** - fluency bit.ly/stmargsnumbots

**Nrich** - Reasoning and problem solving nrich.maths.org

# Foundation Maths Organiser

| Numbers To 20 |
|---|
| 1 |
| 2 |
| 3 |
| 4 |
| 5 |
| 6 |
| 7 |
| 8 |
| 9 |
| 10 |
| 11 |
| 12 |
| 13 |
| 14 |
| 15 |
| 16 |
| 17 |
| 18 |
| 19 |
| 20 |

## Number Bonds Within 5

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 0 + 1 | 0 + 2 | 0 + 3 | 0 + 4 | 0 + 5 |
| | 1 + 1 | 1 + 2 | 1 + 3 | 1 + 4 |
| | | | 2 + 2 | 2 + 3 |

## Doubles

| | |
|---|---|
| 0 | 0 |
| 1 | 2 |
| 2 | 4 |
| 3 | 6 |
| 4 | 8 |
| 5 | 10 |

## Halves

| | |
|---|---|
| 0 | 0 |
| 2 | 1 |
| 4 | 2 |
| 6 | 3 |
| 8 | 4 |
| 10 | 5 |

## Language

| | |
|---|---|
| 5 + 3 | Addition |
| 8 - 3 | Subtraction |
| + | Plus |
| - | Subtract |
| = | Is Equal To |

## Quantity To 10

| | | | |
|---|---|---|---|
| 1 | ● | 6 | ●●●●●● |
| 2 | ●● | 7 | ●●●●●●● |
| 3 | ●●● | 8 | ●●●●●●●● |
| 4 | ●●●● | 9 | ●●●●●●●●● |
| 5 | ●●●●● | 10 | ●●●●●●●●●● |

## Shapes

| | |
|---|---|
| circle | ○ |
| triangle | △ |
| square | □ |
| rectangle | ▭ |

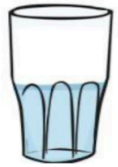
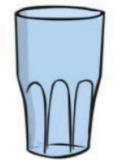
## Pattern

| | | |
|---|---|---|
| Colour |  | blue, green, blue, green |
| Size |  | big, small, big, small |
| Length |  | tall, short, tall, short |

## Months Of The Year

| | | |
|---|---|---|
| January | February | March |
| April | May | June |
| July | August | September |
| October | November | December |

## Capacity

| | | |
|---|---|---|
|  |  |  |
| Empty | Half Full | Full |

## Time

| | | |
|---|---|---|
| O'Clock |  | The minute hand points to twelve and the hour hand points to the hour. |

## Weight

| | |
|---|---|
| Heavy / Heavier / Heaviest |  |
| Light / Lighter / Lightest |  |
| Balanced / Equal |  |