



EYFS NUMBER SCHEME

This scheme is designed to outline the structure and sequential development of number in Reception/EYFS and is to stand alongside the White Rose Education scheme for mathematics.

How to use this scheme

- This scheme is to be used as the basis for number teaching in EYFS rather than the White Rose Education number scheme.
- It is a guide to the order in which a child should meet the various stages, but it may be found that with some children, some stages are interchangeable.
- White Rose activities, stories, and other resources may be used as appropriate, in the delivery of the number curriculum
- Number concepts **must be regularly practised to allow pupils to consolidate knowledge**, even after the main objectives of lessons has moved on following teacher judgement. Although this is a sequential scheme, pupils will need to **regularly cycle back** to revisit these previous steps. Individual pupil understanding should also be regularly checked.
 - Regular informal assessment
 - Starters within full maths sessions
 - Short, independent activities
 - Constant evolution of continuous provision
- The White Rose scheme will be used in the teaching of all other areas of mathematics e.g. shape, time and measures.
- Experience of and play with money will form part of continuous provision.
- Free play with Cuisenaire rods will also form part of maths' lessons and continuous provision

Additional Reading

- White Rose Mathematics scheme for EYFS and Y1
- EYFS framework and Early Learning Goals
- National Curriculum End of Year Expectations for Year1
- Mathematics Guidance: key stage 1 and 2
- Cuisenaire rods scheme

All mathematics teaching will follow the CPA approach (concrete, pictorial, abstract)

Each new step or concept will start with concrete, practical learning.

Children will experience working with a range of physical objects, representations and models in their work. Real life problems should be continually modelled to pupils.



Concrete Apparatus

Various objects (teddies, cars, toys, books etc)

Counters or cubes

Rods

5 frames

10 frames

Numicon

Pictorial Representations and Models

5 frames

10 frames

Part-whole models

Number lines

Number tracks

PRE-NUMBER EXPERIENCE

Pre- number experience is essential and is a continuous part of EYFS

Sorting - by object, colour, shape, size, texture etc. using a wide variety of commercial and environmental objects. Stress that members of a set must have at least one common property.

Stages of sorting: -

- free play
- sorting by one child's own criteria
- sorting by one attribute
- sorting by use
- sorting by more than one attribute.

Stimulate awareness of: -

- the way that individual objects are alike (equivalence)
- the way in which they differ (difference)
- the way in which they can be arranged (order).

Structured play - using relevant vocabulary for each situation. Use of commercial and environmental objects, eg sand (wet and dry), water, role play area, cooking, music etc.

Stages of structured play: -



- free play;
- structured play situation;
- teacher intervention.

EARLY NUMBER EXPERIENCE

Matching - leading to the appreciation of 1:1 correspondence, eg matching cup and saucer, hook and coat etc. Matching between sets to give the idea of equivalence and non-equivalence, eg this set has more, this set has less, this set has the same number as etc. This is helpful in establishing the idea of cardinal number, eg the cardinal number “two” is an abstraction from all conceivable pairs - two toys, two cars, two legs etc.

Sets - sorting and classifying develops the concept of a set, the numbers of which have at least one common property. One property of a set is the number of members it contains. Thus, an empty set has the property of ZERO numbers. This is an important concept.

Ordering - putting objects into a particular order with regard to size etc. Leads to an understanding that numbers can be put in an order of magnitude = 1, 2, 3, etc. Much rich vocabulary here, eg in front of, behind, next to, more, less, bigger, smaller etc. Can be extended to all other aspects of work, including PE.

NUMBER SYSTEM AND PLACE VALUE

THE FOLLOWING CONCEPTS WILL BE APPLIED FIRST TO NUMBERS UP TO 5 AND THEN REPEATED WITH NUMBERS 6 – 10. (to be completed during the autumn term)

1. Counting

Using all available structured and unstructured apparatus. First to 5, then to 10, then beyond, moving through the below sub-steps for each number (and consolidating previous numbers where possible).

By the end of EYFS children should be able to count to at least 20 and have had experience of counting beyond 20 (up to 100) By the end of Y1 children should be able to count to 100.

a) Rote learning of number pattern

Through oral work – using songs here is crucial (traditional songs, internet, Numberfun etc) without numerical symbols. **Much practice needed in this area.** Utilise number games and rhymes. **Ensure both forwards and backwards counting.**



b) 1:1 correspondence

Using a wide range of practical apparatus, ensure that pupils can count sets of numbers correctly. The idea of estimating is important here, eg children should be given the opportunity to make a “sensible guess” before counting.

The aim is that some pupils will begin to be able to subitise.

ie. Conservation of number (subitising) must be established at this stage, eg. a set of 5 objects always has the property of 5 regardless of its arrangement. Crucial that pupils are given the chance to see this and prove to themselves.

Ensure that pupils are able to make sets of a given number.

c) Introduction of written form of number - called NUMERAL.

Stress shape and sound of symbol and correct formation - tracing, sand writing, playdough etc very useful here. Also, number matching games, especially if self-correcting. In class use number displays and class books, eg “Our Book of 5”. Can be linked to colour displays using the Cuisenaire rod colours eg. a white one display, a red two display etc

Use a number track or number line - starting at 0 (zero) both horizontally and vertically.

Children should see numerals of numbers to at least 10 by the end of EYFS but competent mathematicians should have experience of numbers to 20.

2. Number sequencing -

Counting forwards and backwards initially to and from 5, then 10, then beyond. Insertion of missing number in sequence.

eg Forwards from 1: 1, 2__, 4, 5.

Forwards from number other than 1: 4, 5, 6, __, 8, 9.

Backwards: 10, 9, 8, __, 6, 5, 4.

A number line with gaps and an “empty” number line are useful here.

3. Number patterns - help to establish conservation of number, eg how many patterns can be made, using counters, cubes, squared paper, with the number 4.



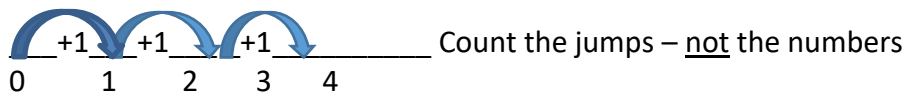
CALCULATIONS

1. 1 more - up to a total of 5.

a) Creating cube towers, using concrete apparatus (counters, bears etc), children make 1 more of a number. Orally explaining the process eg. I have 4 bricks in my hand, if I add 1 more I will have 5 etc before proving with concrete apparatus.

b) Use of Cuisenaire rod staircase, increasing by one more each step.

c) Number track/line for counting on one both horizontal and vertical



2. 2 more - as above but adding on 2.

3. Addition to 5 with 2 numbers

a) Physically, adding 2 sets of objects, eg teddy bears, cubes etc

b) Pictorial addition

eg * * * and * * → * * * * * (using **and** rather than add at this stage)

Vocabulary:- makes, add, plus, total, more than

c) Union of sets – use this as an opportunity to introduce the vocabulary ‘part-part-whole’

d) Part-whole model

e) With dots and/or cubes (use ‘5 frames’)

f) With rods - see accompanying Cuisenaire rod scheme (Year 1&2 but not EYFS)

g) Can also use number track/line

Vocabulary: → = , makes, is equal to, the same as.

h) Input output machines - children to discover what is happening



Pupils should be able to:

- Explain that addition increases sets
- Use concrete apparatus or pictures to add numbers
- Know = means 'balance', 'equivalent' or 'the same as'

4. 1 less (within 5)

- a. Creating cube towers, using concrete apparatus (counters, bears etc), children make 1 less of a number. Orally explaining the process eg. I have 4 bricks in my hand, if I take 1 away, I will have 3 etc before proving with concrete apparatus.
- b. Use of Cuisenaire rod staircase, decreasing by one more each step.
- c. Number track/line for counting back one both horizontal and vertical
- d. Counting backwards, using number line, rod staircase etc.

5. 2 less - as above but with 2 to take away.

6. Subtraction within 5

Three approaches - use them all.

- i) If you take 3 away from a collection of 5, how many are left? $5 - 3 = [\quad]$
- ii) How many do you need to add to 3 to make 5? $3 + [\quad] = 5$
- iii) How many do you need to take away from 5 to make it equal 3? $5 - [\quad] = 3$

NB - Approach i is based on partitioning of sets. Approaches ii and iii are based on the find the difference method.

The children are not expected to be able to perform written calculations using all three methods, but it is important to use the vocabulary and describe subtraction in all three ways.

Vocabulary: subtract, take away, less than, find the difference, minus.

- a) Concrete apparatus (teddy bears, cubes etc)
- b) Part-whole models
- c) Dots and/or cubes (use '5 frames')



d) Rods - see accompanying Cuisenaire rod scheme

e) Number track/line

—————> Vocabulary: = , makes, is equal, to the same as.

f) Input output machines - children to discover what is happening

Pupils should be able to:

- Explain that subtraction decreases sets
- Use concrete apparatus or pictures to subtract /find the difference between numbers
- Know = means 'balance', 'equivalent' or 'the same as'

7. Commutative property of addition

eg $3 + 2 = 2 + 3$ (3 add 2 is the same as 2 add 3)

Use 5/10 frames, counters, cubes, rods (if appropriate) to demonstrate this.

Very important, halves number bonds that needed to be learnt.

8. Number families - for each number up to 5.

Associated subtractions should also be recorded. Use of part-whole models.

9. Mixed addition and subtraction (within 5).

This step should be completed practically and pictorially before being recorded as 'sums'.

$$\begin{array}{ll} 3 + 2 = & 5 - 3 = \\ 4 - 2 = & 4 + 1 = \end{array}$$

10. 1 more/2 more within 10. (Repeat approaches from steps 1 and 2)

11. Addition within 10 with 2 numbers – (Repeat approaches from step 3)



12. 1 less/2 less within 10. (Repeat approaches from steps 4 and 5).

13. Subtraction within 10. (Repeat approaches from step 6).

Include use of '10 frames'.

14. Mixed addition and subtraction within 10

15. Addition to 10 with 3 numbers (including zero)

15. Associative law of addition

eg $3 + (5 + 4) = (3 + 5) + 4$ (The order that numbers are added does not affect the answer)

Note: both commutative and associative laws are best illustrated practically

16. Odd and even numbers

Establish the idea that with an even numbered set all its members can be put into pairs, whereas when this is attempted with an odd numbered set, there is always 1 odd number left.

17. Doubling numbers

Knowing doubles to 10 eg. $1 + 1 = 2$ $5 + 5 = 10$

18. Rote learning of number facts/bonds within 5 (by end of EYFS).

Support this practically and pictorially as well as with numerals and 'sums'.

Additions and subtractions should be learned.

19. Rote learning of number facts/bonds that equal 10 (learn some by end of EYFS).

Use 10 frames, cubes, counters, rods (if appropriate), etc

Also record subtractions from 10.