

# **Numbers and the Number System**

**Mathematics Stay and Play with Seahorse Class**  
**Wednesday 22nd November 2017**

# Numbers and Patterns

- It is vital to lay secure foundations in early mathematics.
- Children need to engage with numbers and to see how to use them in their everyday environment for labelling, quantifying and calculating: we want to help them to develop a better understanding of the world in which they live.



# Numbers and patterns

- Counting is a significant aspect of children's early understanding of number and is the foundation on which quantifying and calculating are built.
- Numbers and Patterns: Laying Foundations in Mathematics has been structured around the following two themes to ensure that children experience high-quality teaching in two aspects of counting:
  - Number words and numerals
  - Counting sets



# Phase 1:

## Number words and numerals

- This focuses on the development of children's awareness, understanding and use of the language of number.



# Phase 1

## Counting sets

- This phase focuses on the development of children's early awareness of quantity.



less



more





# Phase 1

Number words and numerals	Counting sets
<ul style="list-style-type: none"><li>• Use some number names and number language accurately</li><li>• Offer comments or ask questions about numbers, demonstrating their curiosity</li><li>• Say some number names in sequence</li><li>• Show an awareness of numbers in their environment</li><li>• Recognise and continue repeating patterns</li></ul>	<ul style="list-style-type: none"><li>• Show awareness of one-to-one correspondence through practical everyday experience</li><li>• Distinguish between quantities, recognising when a group of objects is more than one</li><li>• Begin to make comparisons between quantities</li><li>• Use some number language, such as 'more' and 'a lot'</li></ul>

# Phase 2:

## Number words and numerals

- The main focus in Phase 2 is the development of children's knowledge and use of the number sequence from one to five, and the recognition of the numbers 1 to 5.



# Phase 2

## Counting sets

- Phase 2 focuses on the development of children's ability to count up to five objects and to recognise, without counting, sets of one, two or three objects







# Phase 2


Number words and numerals	Counting sets
<ul style="list-style-type: none"><li>• Recognise some numbers of personal significance</li><li>• Count forwards and backwards within the number sequence 1 to 5</li><li>• Order numbers in the range 1 to 5</li><li>• Recognise, say and identify numerals 1 to 5</li></ul>	<ul style="list-style-type: none"><li>• Appreciate that numbers can identify how many objects are in a set</li><li>• Count up to five objects by touching each object and saying one number name for each item</li><li>• Know that the last number in the count gives the total</li><li>• Represent numbers up to five, using fingers</li><li>• Recognise groups with one, two or three objects</li><li>• Match groups with the same number of objects (one to three)</li></ul>

# Phase 3

## Number words and numerals

- Phase 3 focuses on the development of children's knowledge of the number sequence from one to nine and **recognition** of the numerals 1 to 9


**Birds on a Wire!**



A interactive lesson with ordering single digit numbers, even and odd numbers, and greater than or less than with single digits.

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# Phase 3

## Counting Sets

- This phase concentrates on extending children's counting skills to enable them to count up to ten objects, actions or sounds accurately





# Phase 3

Number words and numerals	Counting sets
<ul style="list-style-type: none"><li>• Count forwards and backwards within the number sequence 1 to 10</li><li>• Recognise, say and identify numerals 1 to 9</li><li>• Order numbers in the range 1 to 9</li><li>• Say the number that comes after a given number within the number sequence 1 to 10</li></ul>	<ul style="list-style-type: none"><li>• Represent numbers up to ten, using fingers</li><li>• Count reliably up to ten objects, including those that cannot be moved</li><li>• Count actions or sounds</li><li>• Count out a smaller number of objects (up to six) from a larger group</li><li>• Match and compare the numbers of objects in two sets, recognising when the sets contain the same number of objects</li><li>• Move around, or partition and recombine small groups of up to four objects, and recognise that the total is still the same</li></ul>

# Keep maths practical and have fun!

- Bath-time (filling and emptying containers, counting)
- Counting rhymes
- Talk about numbers in the environment (eg, front door numbers, number plates, road signs etc)
- Help with the cooking (measuring, weighing, ordering the recipe)
- Setting table places (how many plates/cups etc)
- Paying in shops (including change)
- Estimating amounts (how many apples/sweets?)

# Phase 4

## Number words and numerals

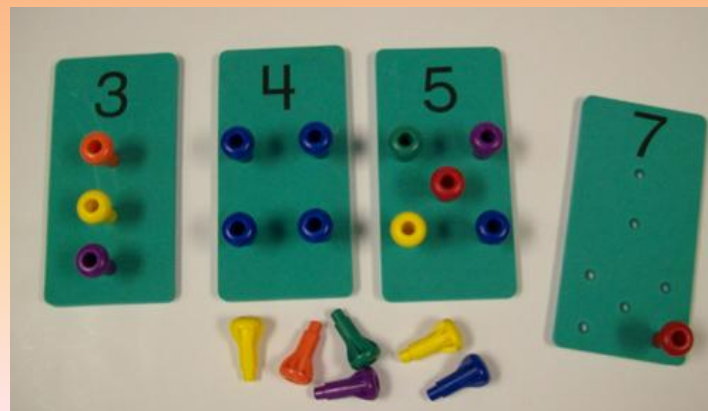
- Phase 4 extends the range of numbers that children can confidently use, including zero and numbers to 20



# Phase 4

## Counting Sets

- Phase 4 focuses on extending children's counting skills to enable them to count up to ten objects accurately, in any arrangement.
- The early stages of addition and subtraction are developed as children begin to partition and combine sets and to remove objects from sets





# Phase 4

Number words and numerals	Counting sets
<ul style="list-style-type: none"><li>• Count forwards and backwards within the number sequence 1 to 20</li><li>• Order numbers across the 10 boundary (e.g. 8 to 11)</li><li>• Use zero and the numeral to represent it</li><li>• Recognise, say and identify numerals 0 to 9 and beyond</li><li>• Say the numbers that come before and after a given number within the number sequence 1 to 20</li><li>• Recognise and continue patterns linked to number</li><li>• Begin to use the ordinal language of 'first', 'second' and 'third' in practical contexts</li></ul>	<ul style="list-style-type: none"><li>• Count reliably any arrangement of up to ten objects</li><li>• Instantly recognise, without counting, familiar patterns of up to six objects</li><li>• Begin to estimate how many objects can be seen and check by counting (up to ten)</li><li>• Find one more or one less than a number from 1 to 10</li><li>• Partition and recombine small groups of up to ten objects</li><li>• Find the total number of objects in two groups by counting all of them</li><li>• Introduce the empty set (0)</li><li>• Recognise that the number of objects in a set does not change if they are moved around</li><li>• Remove objects from a small group and count how many are left</li></ul>



# Phase 5

## Number words and numerals

- Phase 5 focuses on extending the range of numbers that children can confidently use, to include numbers to 30
- Children also start to explore the sequences of numbers when they count from zero in twos, fives and tens



# Phase 5

## Counting Sets

- Phase 5 focuses on extending children's counting skills to enable them to estimate, count and compare sets of up to 20 objects.
- Addition and subtraction are further developed as children partition and combine sets and count on and back





# Phase 5

Number words and numerals	Counting sets
<ul style="list-style-type: none"><li>• Count forwards and backwards within the number sequence 0 to 30</li><li>• Count forwards in twos, fives or tens</li><li>• Recognise, say and identify numerals up to 30</li><li>• Say the numbers that come before and after a given number within the number sequence 0 to 30</li><li>• Identify and explain simple patterns in the number sequence</li><li>• Use the language of ordinal numbers in a range of contexts</li></ul>	<ul style="list-style-type: none"><li>• Count reliably more than ten objects</li><li>• Find the total by combining two groups, where one group is screened (seen and then hidden) and counting on</li><li>• Compare sets of up to 20 objects, using language such as 'more' or 'fewer'</li><li>• Estimate a number of objects that can be checked by counting</li><li>• Instantly recognise, without counting, organised and random arrangements of small numbers of objects</li><li>• Remove a smaller number from a larger and find how many are left by counting back from the larger number</li><li>• Begin to find out how many have been removed from a larger group of objects by counting up from a number</li></ul>

# Phase 6

## Number words and numerals

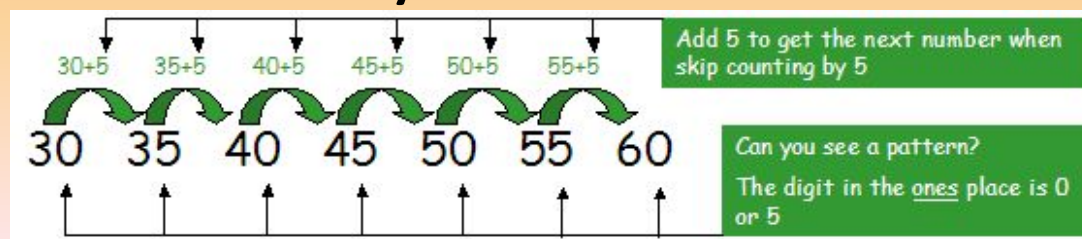
- This phase extends the range of numbers children can confidently use, including numbers to 100
- Children also become more secure in counting forwards and backwards in twos, fives and tens



# Phase 6

## Counting Sets

- Phase 6 focuses on using children's counting skills to support addition and subtraction through counting on and back and through counting from the smaller to the larger number to find a difference.
- Children also use their ability to count in twos, fives and tens to count larger groups of objects efficiently.





# Phase 6

Number words and numerals	Counting sets
<ul style="list-style-type: none"><li>• Count forwards and backwards within the number sequence 0 to 100</li><li>• Say the numbers that come before and after a given number within the number sequence 0 to 100</li><li>• Count forwards and backwards in twos, fives and tens</li><li>• Recognise, say and identify numerals 0 to 100</li></ul>	<ul style="list-style-type: none"><li>• Relate addition to counting on and recognise that addition can be done in any order</li><li>• Count large groups of objects by using efficient strategies</li><li>• Understand subtraction as 'take away' and find a 'difference' by counting up</li></ul>