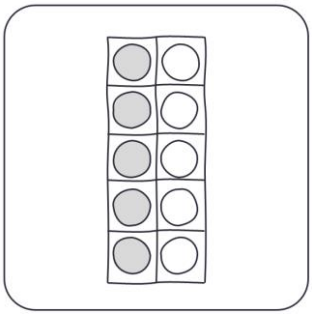
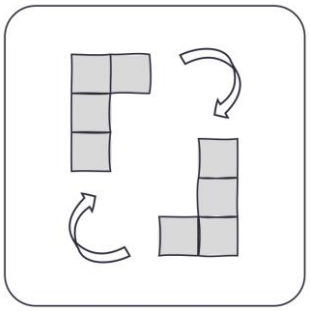
Principles and progression the Early Years Number Sense Programme

Concepts developed

The Early Years Number Sense programme is focused on developing the following three mathematical skills and dispositions:

	Subitising, partitioning and a deep understanding of quantities to 10	From the statutory framework for the early years foundation stage: *"Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers"*
	Spatial awareness	From the statutory framework for the early years foundation stage: *"It is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills"*
	Positive attitudes	From the statutory framework for the early years foundation stage: *"It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes."*

Features of the programme

- **Comprehensive resources**

The Early Years Number Sense programme provides 84 animations, and associated guidance, that collectively cover the majority of the number curriculum in Reception. The only area of number where guidance and resources are not included is the development of counting.

- **Progression through books**

Maths is a hierarchical subject. Providing a coherent learning journey through the mathematics supports children to look for patterns and relationships and spot connections, and to understand new concepts and quantities. The books are planned in an order that means what children have learnt before supports what comes next. You can use the programme to structure your number curriculum around (see our suggested yearly overview for guidance on this). However the books are also organised in a way that should make it really easy for you to find matched content if you already have a curriculum progression for maths in Reception which you follow.

- **Progression within each book**

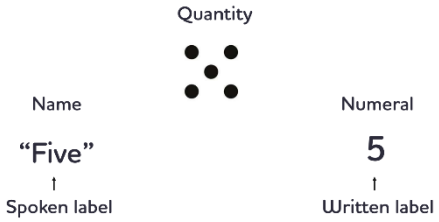
Each book consists of a series of animations that, together with the associated practitioner guidance, are carefully designed to lay out a coherent journey through the mathematics. The example progression provide draws this out for one particular book. Similar progressions run through all books, and so it is important not to use the animations as a 'pick and mix' of activities related to a particular number or concept.

- **Simple, stripped back images which expose mathematical structure**

All of the programme teaching animations are carefully designed to have the mathematics at the centre of all the prompts, and not include unnecessarily distracting images. In writing the programme, we have thought carefully about where we use 'out of context' images such as dots, counters and beads, and where we use images that prompt children to discuss quantities in particular contexts.

- **Developing understanding of quantity before introducing numerals**

The Early Years framework focuses on children developing a deep understanding of quantities. Quantities can be represented in speech by number names, and by written numerals. These names and numerals are randomly assigned labels which represent what is essential to the number – the quantity itself.



It is easy to fall into conflating the number (quantity) with the numeral, and using the word 'number' interchangeably to describe both quantities and numerals. We actually suggest always saying 'numeral' rather than number in discussions and planning sessions with colleagues to provide real precision on what it is we want children to understand.

In the programme we focus first on developing an understanding of quantities by using spoken names only to refer to them. Then, when children have a strong associated between quantities and their spoken labels (name) we can introduce the written label (numeral). This is why many of our animations are split into two halves: the first half with no written numerals showing, and then repeated a second time with the written numeral present.

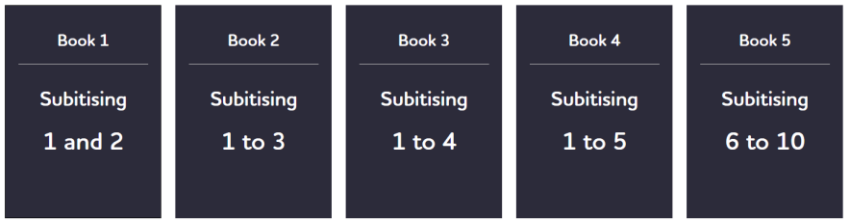
This TES podcast with Daniel Ansari is excellent for a thought provoking listen on when and how we should introduce children to the written numerals that we use to represent quantities, and has informed our writing of the programme, with animations available both with and without numerals.
https://www.podbean.com/ew/dir-73x95-9a7b7b7

- **Built in teacher guidance and subject knowledge support**

Having been involved in teacher PD as an AST and SLE for the last decade, and with the launch of our Number Fact Fluency programme since 2020, our experience is that practice development is most effective when teacher guidance and curriculum resources are provided hand in hand. This programme is written with that principle in mind.

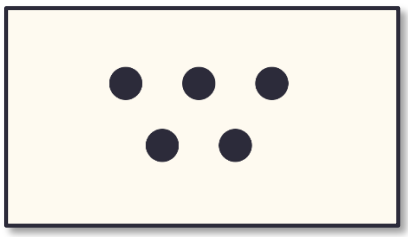
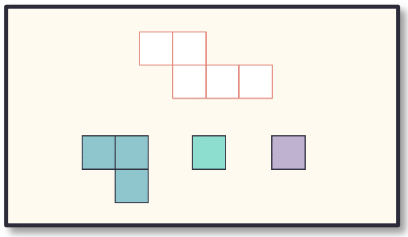
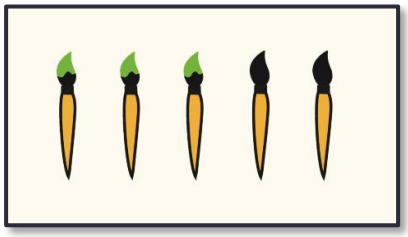
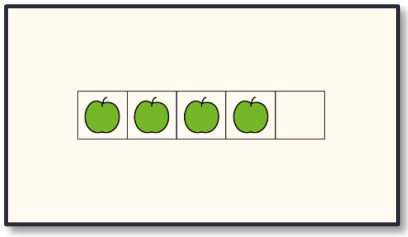
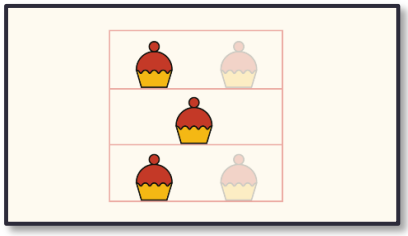
  - Each animation has a guidance page shown at the start, and also printable from the guidance section under the animations
  - There is also a wider teacher guidance section in the portal, providing advice and guidance at a programme level to support you with teaching, planning and assessment

Progression through the books

	Books 1 – 5 focus on subitising. The word subitising comes from the root word 'subitus' meaning suddenly, and is the ability to quickly recognise how many items are in sets of up to 4 or 5 without counting. We are born with the ability to subitise, so starting with a focus on subitising is something that is accessible to all children, regardless of prior experience. The programme books sequentially introduce quantities to five, and provide guidance on how to support children to subitise these quantities. As we can only subitise up to 4 or 5 randomly arranged items, quantities above this amount need to be organised into a recognisable structure for us to subitise them, for example the six dice pattern. For this reason, Book 4 and 5 introduce and develop the use of structured mathematical models and arrangements, such as the five frame and ten frame,
	These books continue to develop children's subitising skills, but rather than focusing just on the whole quantities in the way books 1 – 5 do, they start to focus on splitting up quantities into parts. The Early Learning Goal states that children should automatically recall number bonds up to five and some number bonds to 10. These books support children to do just that. The provide lots of contexts and prompts for partitioning sets, and building strong visual models of each quantity which support children to know the bonds within each number.
	Books on partitioning 6 – 9 are not provided in the previous section as children are not expected to know number bonds for these. However Book 11 supports children to understand more about the composition of these numbers, and to develop a deep understanding of them. By the time children get to Book 12, they will already have a deep understanding of numbers to 10, and have had lots of discussions which involve comparing them. This book pulls together that learning to provide focused resources on comparison. Book 13, patterns in numbers to 10, supports children to learn more about the structure of odd and even numbers, and of doubles, including supporting the recall of some doubles facts as required by the Early Learning Goal

Number Sense Maths

Example progression within a book: Book 9, Partitioning 5

 How do you see five?	Supports open ended discussions of the parts within five	The purpose of this animation is for the children to spend time discussing five-ness in lots of different physical layouts, and to understand that five can be split into smaller parts in many different ways. The arrangements don't have 'right' and 'wrong' ways of seeing them. Providing children say what they see, anything goes. It provides depth of experience of 'five-ness' and the parts within five.
 Collections of five		The aim of this animation is for children to discuss the different ways that visually interesting collections of five can be sorted in. As well as providing a context to incidentally notice numerosity and practice subitising, this also provides a context to develop the mathematical skills of comparison and sorting. As with the previous animation, it provides depth of experience of 'five-ness' and the parts within five.
 Make a pentomino		This animation has dual aims: firstly to develop the children's spatial visualisation, reasoning and language, and secondly to provide a context for playing with five-ness and thinking about parts that can be combined to make a five shape. Despite apparently being a 'shape' animation, as with the previous animations, it provides depth of experience of 'five-ness' and the parts within five in a varied context.
 Tell a story about five	Draws children's attention to the specific number bonds within five	These simple story animations provide a prompt for children to start describing quantities in everyday situations. They also provide a starting point for children to notice and describe the different ways in which five objects can be partitioned into two parts. It is a progression from the previous animations in that it starts to home in on and expose specific number bonds to five.
 How many more to five?	Supports children to recall number bonds to five, using a visual approach	The aim of this animation is to support children to know their numbers bonds to five. Once children can say how many more are needed to make five from the first image (no five frame) then our opinion is that this is evidence that they can 'automatically recall number bonds to five' (part of the Number Early Learning Goal).
 What's missing from five?		As with the previous animation, the aim of this animation is to support children to know their number bonds to five. Once children can say how many more are need to make five from each image then this is evidence that they can 'automatically recall number bonds to five' (part of the Number Early Learning Goal).