



# Maths at Indian Queens Primary School

*"Behold the day. It's yours to make"*



At Indian Queens School we believe that everyone can do maths and there's no such thing as a maths person. Maths is a subject that everyone can and should be able to perform confidently and competently.

At Indian Queens we teach using the mastery approach that allows children to gain a deep understanding of maths, allowing them to gain a secure and long-term understanding of maths that allows them to make continual progress. We teach by breaking down maths objectives into the smallest steps, so that every child is secure in every new concept before moving on, We focus upon teaching for fluency (maths facts and calculating), reasoning and problem solving.





**Mathematics in the Early Years Foundation Stage Curriculum comes under two strands, each of which has an Early Learning Goal attached:-**

### **Numbers**

**Early Learning Goal** - *"Children 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."*

### **Shape, Space and Measures**

**Early Learning Goal** - *"Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them."*



**Mathematics in the Early Years Foundation Stage Curriculum comes under two strands, each of which has an Early Learning Goal attached:-**

### **Number**

- Have an understanding of number to 10, linking names of numbers, numerals, their value, and their position in the counting order;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall number bonds for numbers 0-5 and for 10, including corresponding partitioning facts.

### **Numerical Patterns**

- Automatically recall double facts up to  $5+5$ ;
- Compare sets of objects up to 10 in different contexts, considering size and difference;
- Explore patterns of numbers within numbers up to 10, including evens and odds.





As with all other Areas of Learning, the teaching and learning of mathematics in our Reception classes takes place both indoors and outdoors through a wide range of practical and "hands on" activities.

The staff use their knowledge and expertise to plan for a high-quality learning environment which provides children with lots of opportunities to explore different aspects of number and shape, space and measures and learn new concepts. The children have a wide range of structured play resources available to them throughout the year - this is known as "continuous provision".



For example, children learn about capacity through their water play indoors and outdoors. They use containers of different shapes and sizes to measure and compare and the adults model the use of these resources and the appropriate mathematical language as they support the children in their play.







Children develop their knowledge and understanding of shapes and their properties through their experiences of activities such as junk modelling and block play. Block play also offers children the opportunity to develop their knowledge and understanding of some key concepts relating to number such as "Conservation of Number" which means knowing that when a group of objects are moved around the total remains the same. This is a prerequisite skill to calculation.







We also develop children's early counting and number skills using resources such as board games and dice, number tracks, dominoes and Numicon.



Our outdoor activities include plenty of opportunities for children to count and read and write numbers, such as games using targets or games involving scoring and adding up points such as skittles.







In addition to the opportunities for child initiated play indoors and outdoors, staff plan adult led activities for groups of children and individuals based on their observations of what children know and can do. They plan activities to address any misconceptions that have arisen and to introduce new concepts.





When we plan, we focus on six key areas of early mathematical learning, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school and beyond:

These six areas are:

- Cardinality and Counting
- Comparison
- Composition
- Pattern
- Shape and Space
- Measures





# Cardinality and Counting

The cardinal value of a number refers to the quantity of things it represents, e.g. the numerosity, 'howmanyness', or 'threeness' of three. When children understand the cardinality of numbers, they know what the numbers mean in terms of knowing how many things they refer to. **Counting is one way of establishing how many things are in a group, because the last number you say tells you how many there are.**

Children enjoy learning the sequence of counting numbers long before they understand the cardinal values of the numbers. Subitising is another way of recognising how many there are, without counting.

<https://www.youtube.com/watch?v=vyjHrDpBIKo>

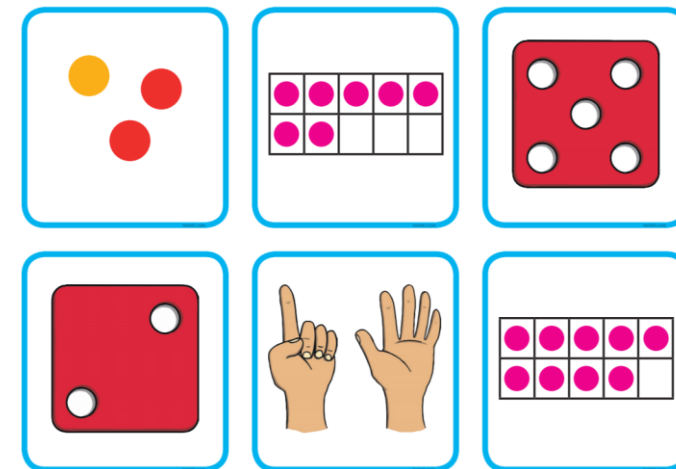


<https://www.youtube.com/watch?v=2esja2p4ysc>



# Subitising

**Subitising is recognising how many things are in a group without having to count them one by one.** Children need opportunities to see regular arrangements of small quantities, e.g. a dice face, structured manipulatives, etc., and be encouraged to say the quantity represented. Children also need opportunities to recognise small amounts (up to five) when they are not in the 'regular' arrangement, e.g. small handfuls of objects.



<https://www.youtube.com/watch?v=Lwt7NgfeZRY>





# Comparison

Comparing numbers involves knowing which numbers are worth more or less than each other. This depends both on understanding cardinal values of numbers and also knowing that the later counting numbers are worth more (because the next number is always one more). This understanding underpins the mental number line which children will develop later, which represents the relative value of numbers, i.e. how much bigger or smaller they are than each other.

Uses the language of 'more' and 'fewer' to compare two sets of objects. (M: N 40-60)

**It's Getting Hot**

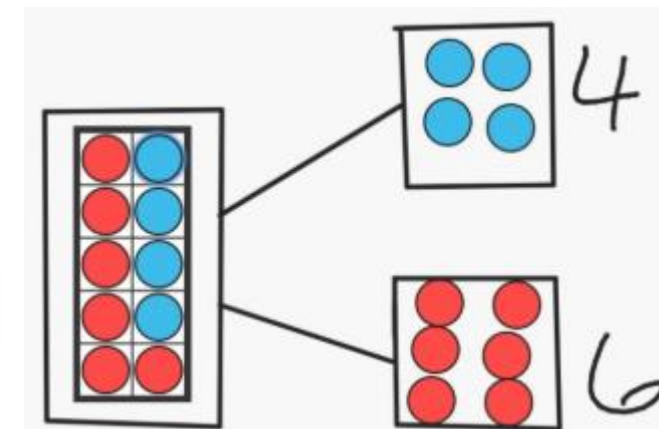
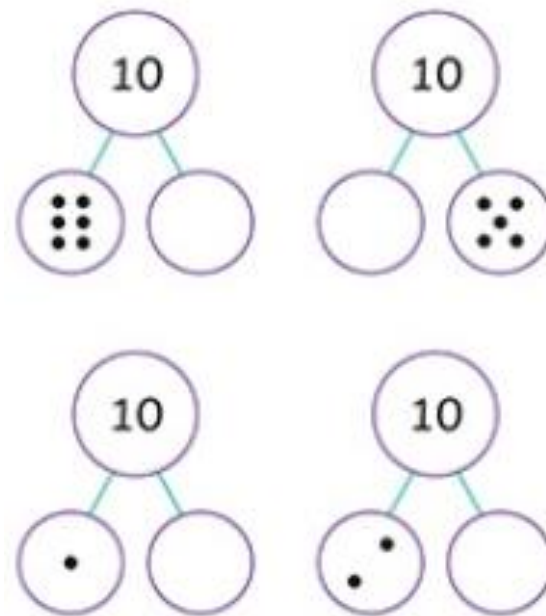
**There are lots of ladybirds on the leaves!**

Pick a yellow card and look at the ladybirds. Which leaf has more ladybirds?  
Which leaf has fewer?



# Composition

Knowing numbers are made up of two or more other smaller numbers involves 'part-whole' understanding. Learning to 'see' a whole number and its parts at the same time is a key development in children's number understanding. Partitioning numbers into other numbers and putting them back together again underpins understanding of addition and subtraction as inverse operations.



<https://www.youtube.com/watch?v=ICRiPnDink4>

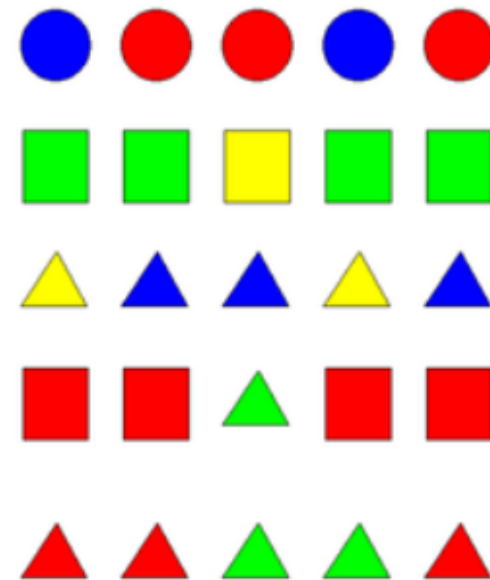




## Pattern

Seeking and exploring patterns is at the heart of mathematics. Developing an awareness of pattern helps young children to notice and understand mathematical relationships.

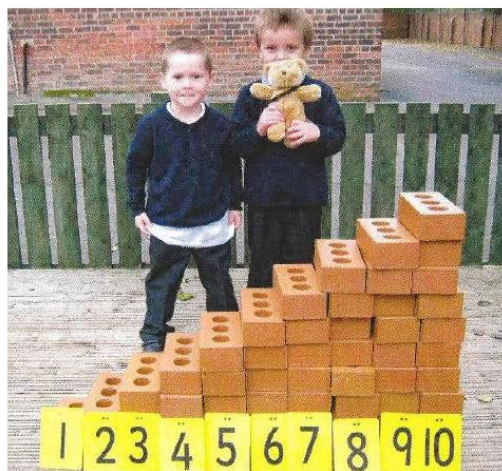
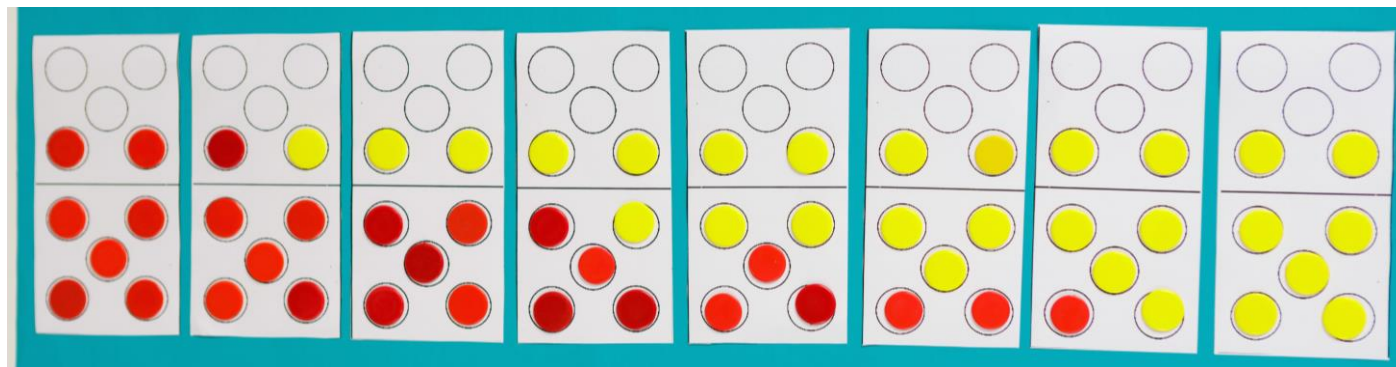
Repeating patterns, progressing from children copying simple alternating AB patterns to identifying different structures in the 'unit of repeat', such as ABB or ABBC. Patterns can be made with objects like coloured cubes, small toys, buttons and keys, and with outdoor materials like pine cones, leaves or large blocks, as well as with movements and sounds, linking with music, dance, phonics and rhymes.







## Pattern in number



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





# Shape and Space

Mathematically, the areas of shape and space are about developing visualising skills and understanding relationships, such as the effects of movement and combining shapes together, rather than just knowing vocabulary. Spatial skills are important for understanding other areas of maths and children need structured experiences to ensure they develop these. Here, the focus is on actively exploring spatial relations and the properties of shapes, in order to develop mathematical thinking (rather than on shape classification, which requires prior knowledge of properties). This section is concerned with developing the two aspects of spatial awareness and shape awareness, with some progression identified within each.







# Shape

Through play – particularly in construction – children have lots of opportunities to explore shapes, the attributes of particular shapes, and to select shapes to fulfil a particular need. Children need opportunities to construct and create things that represent objects in their environment. As they do this, they should notice shape properties of the object that they want to represent; encourage them to think about the appropriateness of the shapes they choose. Examples of this may include representing a ball as a circle, building a train from wooden rectangular blocks, or using a curved block for the elephant's trunk.







## Space or spatial awareness

Children need opportunities to move both themselves and objects around, so they see things from different perspectives. This will support them in visualising how things will appear when turned around and imagining how things might fit together.

They need to make constructions, patterns and pictures, and select shapes which will fit when rotated or flipped in insert boards, shape sorters and jigsaws. These experiences will support them in noticing the results of rotating and reflecting images, and in visualising these.

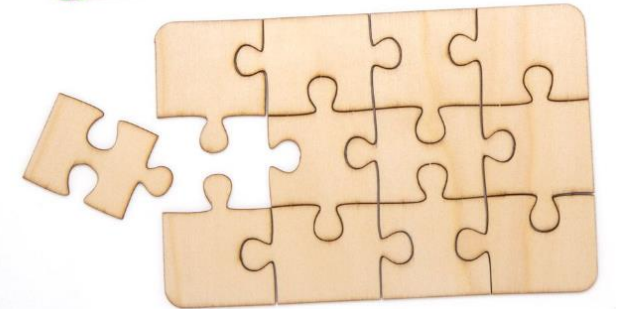
Children need opportunities to be exposed to and to use the language of position and direction:

**position: 'in', 'on', 'under'**

**direction: 'up', 'down', 'across'.**

Children also need opportunities to use terms which are relative to the viewpoint:

**'in front of', 'behind', 'forwards', 'backward's ('left' and 'right' to be used later on as ideas develop).**







# Measure

Mathematically, measuring is based on the idea of using numbers of units in order to compare attributes, such as length or capacity. Children need to realise which attribute is being measured, e.g. weight as opposed to size, and the idea of conservation: that the amount stays the same, even if the appearance alters, e.g. if dough is stretched out or in bits. Children need to understand how equal size units are used repeatedly to express an amount as a number.

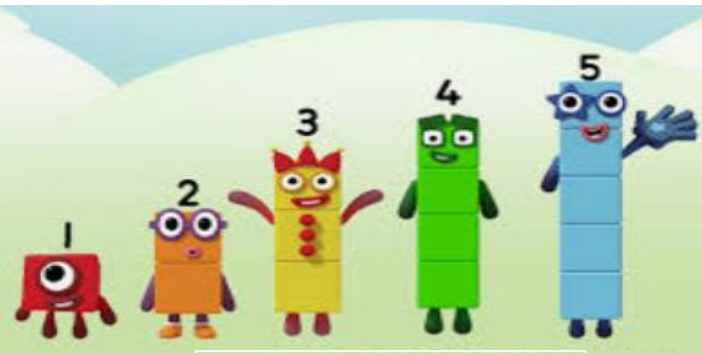
While young children can engage actively in making comparisons and exploring equivalence of length, volume, capacity and weight in different ways, some of these ideas are challenging and will develop later in primary school. For instance, weight is difficult to distinguish from size since it is invisible. While time is also elusive to measure, young children can sequence events and, for example, count 'sleeps'.



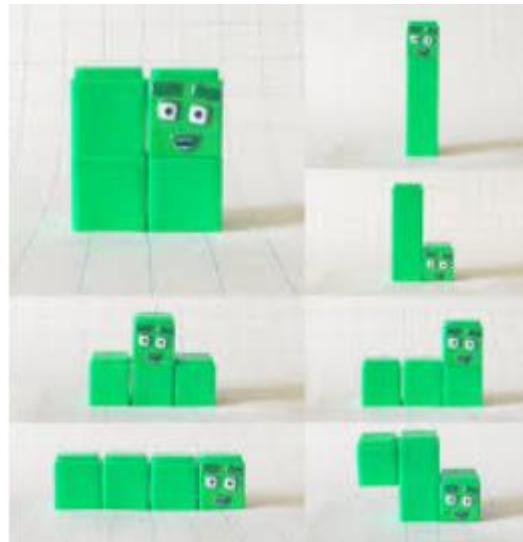




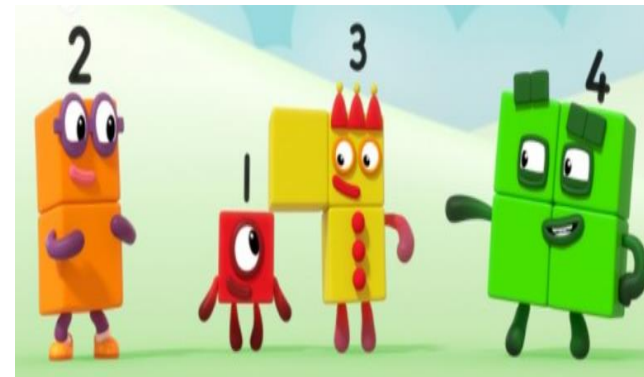
We use Numberblocks in Minpins to introduce the children to numbers. Once when they are in Reception, we use it to help teach...



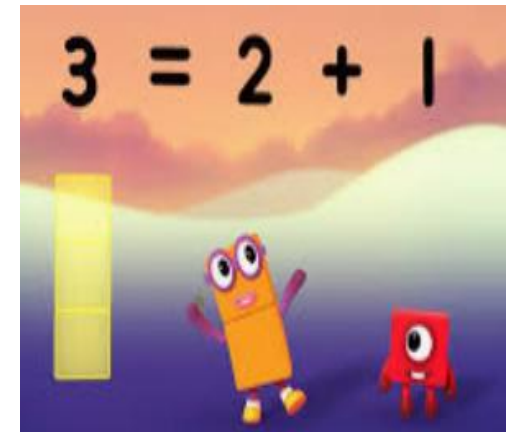
**Cardinality  
and  
Counting**



**Subitising**



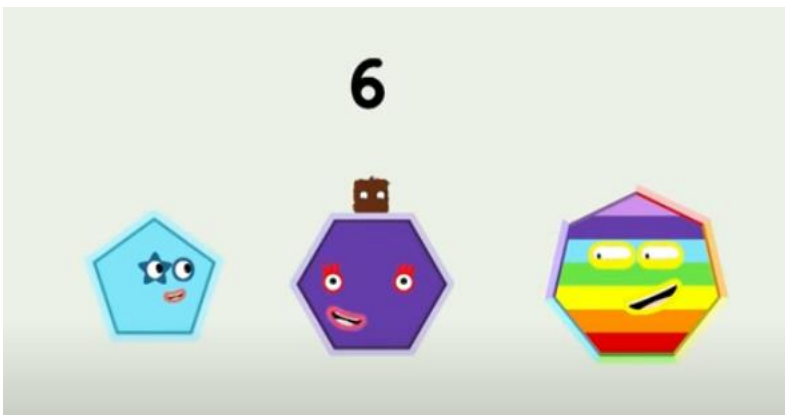
**Comparison**



**Composition**



**Pattern in Number**



**Shape**



**Measure**





Your child is learning when they are watching you using maths and maths language in everyday ways.

