

# Early Years Numeracy Workshop For Parents.

The Foundation Stage curriculum for mathematics has two aspects, **Numbers** and **Shape, Space and Measures**. At the end of their year in the Reception class all children are expected to meet these Early Learning Goals which are extremely challenging! Here they are:

## Numbers.

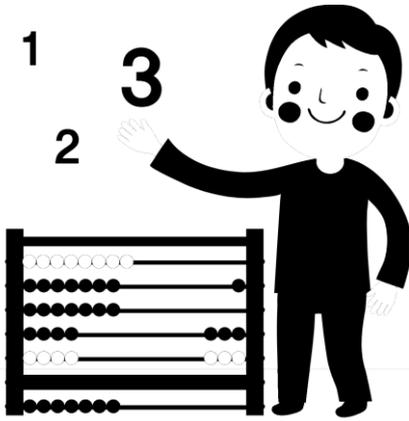
*‘Children count reliably with numbers from one to twenty, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling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

## Shape, Space and Measures.

*‘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’.*

Should a child reach the Goals before the end of Reception, they progress to the curriculum followed by Year One. Children enjoy mathematics because we make it fun! Every lesson begins with some essential counting games and rhymes. This helps children to get their brains ready to start thinking! If children are taught counting patterns it helps to prepare them for learning next steps. For example counting in twos, fives and tens is essential when learning to use money.

Many of these actions require children to cross the midline of the body and so encourage the two halves of their brains to work together.



## Numbers.

To count objects accurately children need to be able to:

- Know the number names in the right order;
- Know that the last number you say is the last number in the count;
- Co-ordinate saying one number name for each object;
- Know a way of keeping track of how many you have counted (e.g. moving them).

*Counting objects like this is just one aspect of counting. It is also important to be able to count:*

- Actions, e.g. jumps;
- Objects that cannot be moved, e.g. the number of children in a picture;
- Objects that cannot be touched, e.g. lights hanging from the ceiling;
- Sounds, e.g. beats on a drum;
- Familiar objects that cannot be seen at that moment, e.g. the number of people who live with you at home.

## How do young children develop skills in Numeracy?

Children use their senses to sort and classify information even before they are able to speak. Throughout this time they are participating in experiences which lay the foundations upon which mathematical concepts will be built later on. When a child plays 'peek-a-boo' they are beginning to understand that an object can exist even when it is out of sight. This is the very beginning of the concept of conservation.

When children scribble on paper they are developing their fine motor control and co-ordination. This is important for writing numerals. By joining in with number rhymes and counting games, your child will learn to associate numbers with pleasure and you are also helping to develop both their memory and auditory discrimination at the same time.

Books that involve counting are a fantastic way of supporting early number. By making maths fun we will prevent the anxiety that many of us felt when we were learning mathematics as children.



**Remember**, understanding number is much more than being able to recite number names in order or even to be able to recognise numerals. It is better if young children develop an awareness of what each number means and it is more important to count real objects than pictures in work books! A firm understanding of the **conservation** of number and **place value** is vital for children as they go on to use number in future.

### Mathematical Language.

To be able to become a good mathematician an understanding of mathematical language is essential and children should be encouraged to use correct vocabulary from the start. Children should also be encouraged to share their thinking and talk about how they have arrived at an answer. Good child-friendly mathematical dictionaries are available and would be useful to have in the home. It is important for children to understand that some mathematical problems have one answer but others have several possible ones, for example,  $6 + 2 = 8$ . A more challenging question would be, 'How many different pairs of numbers add together to make 8?' or 'Can you think of three numbers that we can add together to make 8?'

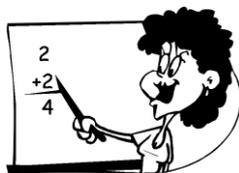
### Place Value.

Until children have a good understanding of place value, it is important that their early experiences with calculating are limited to numbers no greater than 9. If place value is only taught superficially, children may struggle with understanding money, decimals, fractions etc in the future. Though children may recognise numbers to one

hundred, they may not fully understand what the written number represents. Children should have plenty of practical experiences counting out larger sets and grouping them into tens.

One way we help children to understand place value is that 10 represents one set of ten and no units or ones. At school, children are given lots of practical experiences making sets of ten. They do this by exchanging a group of ten objects into one 'ten' often using equipment such as 'Numicon' or 'Multibase'. Zero is a Hero because he can add ten to a number just by standing next to it!

An old-fashioned abacus is an excellent way of helping children to understand our number system.



## Early Calculations.

To achieve the Early Learning Goals children need to be able to add, subtract and share. Practical experience using real objects, or what we refer to as 'manipulatives', is essential. As each step in calculation is taught then this should be applied in real life situations and when solving problems.

### Learning to add.

This starts with adding one more to a group of objects then recounting to find out how many there are altogether. In school we use themed addition mats and a variety of manipulatives to help children with this concept. For example, when covering the theme 'Jack and the Beanstalk' the children have beanstalk adding mats and sets of red and green leaves to count. At Christmas time, they have mats with Santa's sacks, Christmas puddings etc.

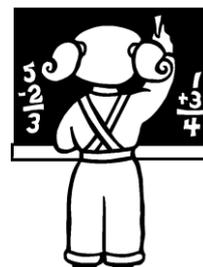
Children will need a lot of practice adding different groups of objects together but **as soon as possible they should be counting on from their first number**. As this concept is taught it should be applied to real life situations. For example, 'I have three sweets and you have four. How many is that altogether?'

Alongside practical experiences, children should also be encouraged to develop mental strategies including:

- Knowing number bonds to ten thoroughly and having an instant recall of these facts.
- To be able to place the largest number in their heads and count on.

## Learning to take away.

For most children this is an easy concept to grasp, especially when linked to food such as sweets or raisins! Once more it is vital for them to use a variety of different manipulatives including counters, bricks etc.



## The Use of Formal Notation.

During the early stages, children will record numbers and calculations by making their own marks, sometimes tallies. As they progress they will be introduced to writing numerals correctly and to standard notation, using mathematical signs such as + and =. It is always better if children are taught the correct formation of numerals from the start. In the early stages your child may use marks to represent their count, this is to be encouraged and is especially good if they are an accurate representation! Once children begin to use tally lines accurately, please remember that these should be taught as follows:

	represents 1
	represents 2
	represents 3
	represents 4
	represents 5
	represents 10

## Using Number Lines and Tracks.

In all classrooms around the school, number lines and hundred squares are displayed and are referred to throughout the day. During morning routines they count the number of children present and then count along to see where that number appears on the line. It is a valuable way of learning how to answer questions such as, 'There are three children away today. How can we find out how many we have here on the number line?'

As children move on, they use number lines to add by counting on and subtract by counting back.

## The importance of games.

Number lines and tracks are often used to play games. We use games in school to support every step in mathematics. Games are fun for all ages. They:

- Come in a variety of forms and degrees of challenge.
- Are popular with children who are usually highly motivated by them.
- Encourage children how to take turns and abide by rules!
- Are available to suit every level of development. Dominoes are great for counting and matching. Simple track games such as 'Snakes and Ladders' are useful when children are learning to count on and back. 'Monopoly' is excellent when learning how to add and subtract three digit numbers.

## Doubling, Halving and Sharing.

Once children have an understanding of the conservation of number and basic calculations, they can progress to doubling and halving. Again the rule of **practical experiences** first is vital. There is no better way of learning about half than by sharing a pizza, cake or biscuits! Children should link halving to sharing between themselves and another person. 'I have 6 sweets and I am going to give half of them



to you. I always share fairly, so there will be 3 for me and 3 for you!

## Shape, Space and Measures.

### 2D and 3D Shapes.

Early experiences with shape sorters are excellent preparation for developing concepts about shape and space. Using shaped wooden bricks to build with helps children to understand the properties of 3D shapes. Use objects in your child's own environment to learn about shape and to learn some mathematical names. They could collect objects with a similar shape, e.g. cylinders or cuboids. Unpick a cardboard cereal box to discover the 'net'. Draw a face on each side of a cardboard cereal box and then talk about how many faces there are.

### Pattern.

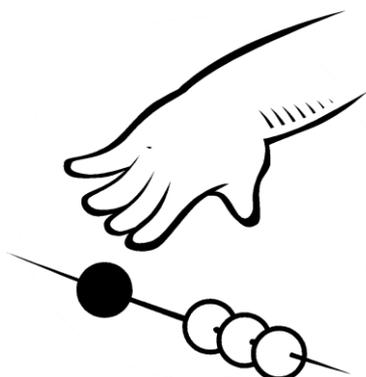
Pattern is an underlying theme in mathematics. Encourage your child to talk about patterns on gift wrap, wallpapers etc. Use pasta, buttons, counters, or any found objects to make repeating patterns.

## Measures.

Comparative language is always tricky to learn and the more it is used at home the better. Children often get confused by this so ensure they use the correct terms every time.

- **Length.** Long and short, tall and short. Build a tall tower with Lego and a short tower. Which one uses the most bricks? Remember that to measure fairly there should be an agreed starting point! Measure ribbons. 'Which is the longest? Shortest?'
- **Weight.** Heavy and light. Involve your child in some cooking activities, especially weighing the ingredients.
- **Volume/Capacity.** Full and empty. Make a collection of different shaped and sized containers and draw lines on them. Ask your child to fill them to up to the lines. Use one container as a measure and see how many it takes to fill each container. Use small objects such as pasta shapes. 'How many shapes fit in the small box?'
- **Time.** This is a very difficult concept for young children and it helps to talk about time using vocabulary including: morning, afternoon, yesterday, tomorrow. Using a simple egg timer to count how many times they can run around the garden. Time your child getting dressed in the morning. It makes it fun and they can challenge themselves to get faster each day!

At the same time calculations are being taught and are applied to all these concepts. For example when threading beads, 'my string is longer than yours it has 8 beads and yours has 6. How many more do I have?'

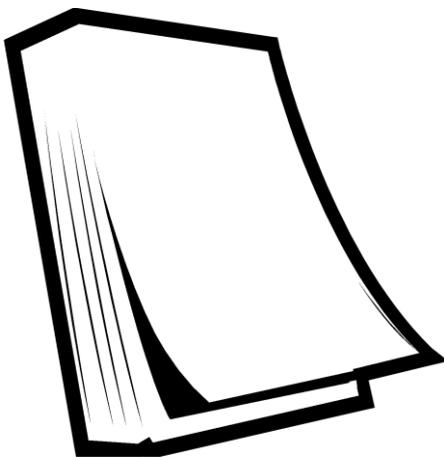
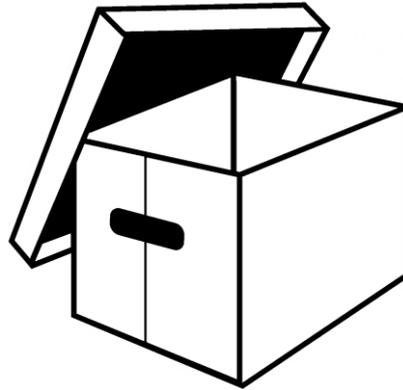




## Helping at Home.

We have prepared a booklet of ideas you may enjoy using with your child. You could also work together to create and decorate their very own number box. You could include in your box:

- Collections of small objects for counting and sorting into sets of ten.
- Tape measure and rule.
- Number lines and hundred square.
- Coins in an old purse.
- Clock face.
- Numeral formation sheet.
- 2D and 3D shape mats.
- Note pad and pencils.
- Egg timer.
- Calculator.
- Dice.
- Set of number cards to order.
- Counters.
- Counting string made by threading ten of different colour beads until you have one hundred in total.



## Early Numeracy through Stories.



# 'Harry and the Bucketful of Dinosaurs'

### Contents:

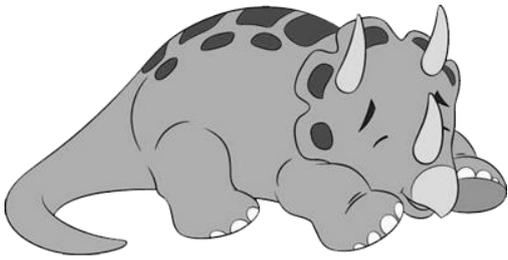
*The story book, a blue bucket, 4 large dinosaurs, 20 small dinosaurs in a bag, fake grass and a piece of wood.*

The contents of the bag have been chosen to inspire play. But please be aware, the ideas your child chooses for play may be different from the ones you had in mind! Watching and listening to your child play will show their interests as well as reveal a lot about their capabilities! By 'thinking out loud' as you play alongside your child you can help them to learn the language necessary for thinking and problem solving. Although this pack is intended to promote mathematics, no one learns in discrete subject boxes so expect to be led into all kinds of imaginative play. Children who know how to play have the potential to become confident, enthusiastic and lifelong learners! Have fun!

### Here are some suggestions:

- The illustrations in the book provide opportunities to talk about number, for example, 'How many dinosaurs do you think Harry has? Do they all fit into his bucket? How many dinosaurs will Harry take to the library? There are two dinosaurs in the bucket and three walking. How many altogether?'
- There are different numbers of dinosaurs on each page. Count them.
- Play alongside your child sorting the dinosaurs, modelling language to describe similarities or differences. For example, 'I am going to sort and count all the brown ones.'
- Playing with the small dinosaurs will give you the opportunity to count out larger groups of objects. Always model counting with one to one correspondence, 'Let's count twelve dinosaurs into the bucket.'
- Place the small dinosaurs into pairs and practise counting in twos.
- Explore estimating with your child. Don't worry if an estimate is inaccurate but check by counting them.
- Count out ten of the small dinosaurs then share them into two equal sets. Model, 'I have shared them fairly. I have five and you have five. Five doubled is ten and ten halved is five'.

- Using the small dinosaurs say, 'Here are eight dinosaurs. Let's put half of them on the grass and half into the bucket.'



- Use some construction toys such as Lego to build a home for one of the large dinosaurs and one of the small dinosaurs. Talk about the differences. Ask, 'Which home needed the most bricks?'
- Use the dinosaurs to model prepositions. Say, 'Let's hide the large dinosaur **behind** the log.' 'Let's put a small dinosaur **into** the bucket!' Use more words: **beside, next to, under, over, out**, etc.

