DERBYSHIRE & NOTTINGHAMSHIRE EARLY YEARS STRONGER PRACTICE HUB

Supporting & Empowering Early years



# CASE STUDY

MAY 2023

### USING NURSERY RHYMES TO DEVELOP YOUNG CHILDREN'S NUMBER SENSE

#### **INTRODUCTION**

My name is Grace Garrett and I have been a teacher for 10 years and worked as an early years' lead in a city school for 7 years. I have recently left my teaching career behind to become a childminder and currently look after children in my own home aged from 9 months to 4 years. Despite not enjoying maths myself at school and always feeling like I was no good at it, teaching it was something I really enjoyed. When the maths mastery approach was introduced across schools it really made me realise that maths was something I could understand when it was presented to me in a logical way through concrete resources. My passion for teaching mathematics was ignited by delving deeper into how teaching our youngest children true number sense, rather than rote learning and rules, would stop other children feeling averse to maths throughout their education as I did. I believe maths can be fun and brought to life by the world around us, which is something I strive to do for the children in my care.



GRACE GARRETT, Childminder

### WHY NURSERY RHYMES TO SUPPORT MATHEMATICAL CONCEPTS?

Nursery rhymes have a wealth of benefits for young children and many of them have great links to mathematical concepts. Songs can encourage children to represent numbers on their fingers, with pictures and real objects, all of which help with recognising quantities and counting with one to one correspondents. However singing alone will not guarantee children learn these mathematical concepts. Much of the maths needs to be drawn out by the adult in order for the children to get the most out of the songs. As many of the songs are familiar to children, it means that the adult really can focus on the mathematical learning.

Many of the traditional rhymes you would link to counting and maths include 'Once I Caught a Fish Alive,' '5 Current Buns' '5 Little Speckled Frogs' and '5 Little Ducks.'

These are great for teaching children to count in sequence and for building concepts such as one less and subtraction. These are all vital skills for young children to be exposed to, however there is much more number sense that is needed before children truly understand our number system and these difficult concepts.

# WHAT ARE THE FOUNDATIONS FOR TEACHING NUMBER SENSE TO YOUNG CHILDREN?

Number sense is outlined by many researchers as the ability to work confidently with numbers. To me it is about recognising and using the patterns of our number system to help solve a range of mathematical problems.

The Education Endowment Foundation explains that building up to these key skills are vital for children's number sense:

- Counting using one to one correspondence (pairing one number word with one and only one item)
- Cardinality (the last number tells you how many there are)
- Subitising (recognising how many numbers are in a small group without counting)
- Recognising that numbers are made up of other numbers (part whole method)
- Comparing quantities and knowing which has more or fewer

## HOW DO I USE NURSERY RHYMES TO TEACH KEY CONCEPTS OF NUMBER SENSE TO CHILDREN?

With our theme currently being frogs, I chose to base my case study on how I used the song '5 Little Speckled Frogs' to teach children some of the skills listed above. At first I ensured that the children knew the song well so that when I introduced some mathematical language and concepts we were no longer focusing on learning the words or actions. I began by bringing the song to life creating a frog pond in the tuff tray outside. I had 2 logs with lots of different types of frogs on. We talked about the frogs' colours and patterns, how many legs they had, and also crucially compared them using the words same and different. To many this may not seem like maths, but pattern and comparison are vital skills for children to master before delving into the world of number.

Having the 2 logs provided an opportunity to compare quantities using language such as more or fewer. For my youngest children 'more' was enough and with very obvious quantity differences they were able to point or say which log had more frogs on. It also provided some opportunities for sorting the frogs into categories using criteria such as spotty, stripy or by colour. The Education Endowment Foundation also recommends introducing the 'odd one out' all of which helps to 'support the child to use attributes to identify the units that repeat in patterns and sequences and to analyse rules.'

The next stage was to bring the song to life using concrete manipulative resources. I introduced subitising by not always placing the frogs in a straight line on the log but in a dice pattern or in groupings of 2 and 3. Just this simple exposure to numerical pattern helps children to recognise that numbers can be presented in different ways and that even when you move them around the amount stays the same. The one less and subtraction element of the song is quite advanced for the age of my children, therefore I wanted to use the concept of 'part whole' by drawing their attention to there being 2 in the pond and 3 on the log but still 5 altogether (we also did this with the number 3 and 4 before number 5).



After using the 'real' frogs as a concrete resource I then introduced a pictorial version of the song. A felt board with the frog pictures added another element to their understanding and I paired this with showing them the amount on my fingers too. I've always found that repetition and drip feeding concepts to children to be the best way for them to become confident with numbers. For example, one day I might show 3 using the usual first 3 fingers and then another day I might represent it using my thumb and then ring finger and little finger. This reinforces subitising and part whole concepts as well as showing that there can be different ways to represent numbers in maths. With young children, it is preferable to use resources in this way; concrete, pictorial and then representation (in this order) as jumping straight to representation can be confusing for them.

As we sang the song, if children wanted to practise their counting skills rather than subitising then this was also encouraged. For example, when one jumped into the pond 1 wouldn't expect the younger children to recognise instantly the amount that was one less but 1 would perhaps challenge the 4 year old to know without counting them all again.

This highlights how such rhymes can be differentiated for different ages and can also be a great assessment tool for where the children are in their understanding of numbers.



Here are a few examples of how to encourage recognising parts of whole numbers. Asking questions such as 'How many frogs are in the pond? How many are left on the log?" This also helps with children's subitising skills.



We used the logs to sort the frogs into categories such as 'blue' and 'not blue,' 'spotty' and 'not spotty.' We could then practise language such as more and fewer.

Using our pictorial resource we could continue to subitise and see the parts in numbers. By encouraging the children to choose any frog to take away also highlighted that it didn't matter which frog jumped or in what order the outcome would still be the same.



#### FINDINGS AND SUCCESSES

Counting skills: One of the Early Years' Foundation Stage birth to three statements in mathematics is for children to use 'counting like behaviour, such as making sounds, pointing or saying some numbers in sequence.' I was thrilled to observe one of my 20-month-old children pointing and babbling with counting like intonation, the frogs during free play. Comparison: The children were able to use the language of same and different when comparing the frogs.They enjoyed placing the frogs on the 2 logs and saying who had more and using words like 'lots' and 'loads.'

Subitising and part whole: For my 4 year old, splitting the representation of the frogs on my fingers across both hands for numbers such as 3, 4 and 5 got him to subitise and recognise parts of numbers too. He also loved having a go at making his own ways of showing the number using different fingers. Throughout the week of playing with the frog pond I was noticing that even some 2 year olds were able to subitise the numbers 2,3 and 4 when playing with the frogs.

#### **FINDINGS AND SUCCESSES**

I hope I have been able to show that teaching young children the foundations of maths doesn't need to be done using number flashcards or number lines, counting endless objects, or realising that the number song you're singing has a maths concept way above your children's understanding!

We can still use these much loved rhymes every day and draw out the maths using simple questioning and resourcing. It is important to scaffold the children's learning with lots of language exposure, modelling these concepts and explaining what you're doing. For example, when you subitise a number, say out loud

"I knew that without counting them all because I can just see that there are 3."

Use different words to compare things such as similar, same, different, more, fewer, loads, lots, not many in all aspects of your routine and play and the children are sure to copy. Continue to model counting objects by moving them as you go and making it clear that the last number you said tells you how many (cardinality). Below I have listed a range of songs that you could use to help with children's number sense and hope that it's something everyone can feel confident to implement in their practise.

- 5 Little Men in a Flying Saucer
- 5 Current Buns
- 5 Little Speckled Frogs
- 5 Little Ducks
- 10 Green Bottles
- 10 in the Bed
- 5 fat sausages
- Hickory Dickory Dock
- 1,2,3,4,5, Once I caught a fish alive
- One, Two, buckle my shoe
- 5 little Monkeys jumping on the bed



### REFERENCES

Ea	arly years
fo	undation stage
st	atutory framework
For	group and school-based providers
Set dev birt	ting the standards for learning, elopment and care for children from h to five
Pub	lished: 8 December 2023
Effe	ctive: 4 January 2024