Making it all add up

Get your children adding and subtracting with confidence with **Judith Stevens'** guide to calculating in the early years...

Although we are still awaiting the revised EYFS as I write, it is already clear that the whole of mathematical development will include just two sections: 'Shape, space and measures' and 'Numbers', which includes all aspects of numbers as labels and for counting, and calculating. This is partly as a response to practitioners, some of whom felt that the existing early learning goals for numbers as labels and for counting were too simple. Indeed, the DfE national data shows that 90 per cent of children achieved a 'good level of development' – 6 or above – for numbers in 2011. Additionally, the assessment scale with the highest percentage of children working beyond (nine points) the early learning goals was numbers as labels and for counting with 15 per cent of all children.

However, analysis of EYFSP results reveals that while children are generally making good progress across the 13 scales of learning and development, achievements are consistently lower in the scales of writing and calculation. Only 78 per cent of all children (75 per cent boys) achieved 6+ for calculating. We know that many practitioners are very good at teaching children about numbers – often in very hands-on, practical ways, through songs, rhymes and everyday experiences. But not all practitioners are as confident in supporting children's developing skills in calculating.

In this article, we will consider practical ways to support calculation, building on children's growing number knowledge.

Subitising

When we play games with dice, we don't count all the spots of the dice each time – we recognise the number instantly. This ability to recognise a small number of objects without counting is called subitising and is important in calculating. Children need lots of opportunities to develop their subitising skills, and with lots of finger rhymes and dice games they will soon begin to improve. When children are counting up, it is important to encourage them to continue from the number of items they can subitise without starting the count from one.

Core rhymes

Practitioners in early years settings use number rhymes to support counting, but this can often be in a slightly random way – chanting children's chosen rhymes and songs as they are requested. We need to plan a more systematic approach to using number rhymes to support counting and calculating.

Identify a group of 8–10 rhymes that support both counting forwards and backwards, and plan to introduce one rhyme each week. Share other rhymes too, but keep the focus for the week on one particular rhyme. Develop a box to store all the resources that support each rhyme. If the focus for the week is *Five currant buns*,

TRY
Count it frog

Include calculation as a short daily ritual at a group time. Identify a large cuddly toy or puppet frog – one with a zippy mouth is best – and use it to signal calculating time. Make a collection of 10 plastic bugs with the children and count them together. As the children close their eyes, 'feed' some bugs to Count Frog. Count the remaining bugs together. If there were 10 bugs and now there are four, how many has Count Frog eaten? Where appropriate, extend the number of bugs to 20.

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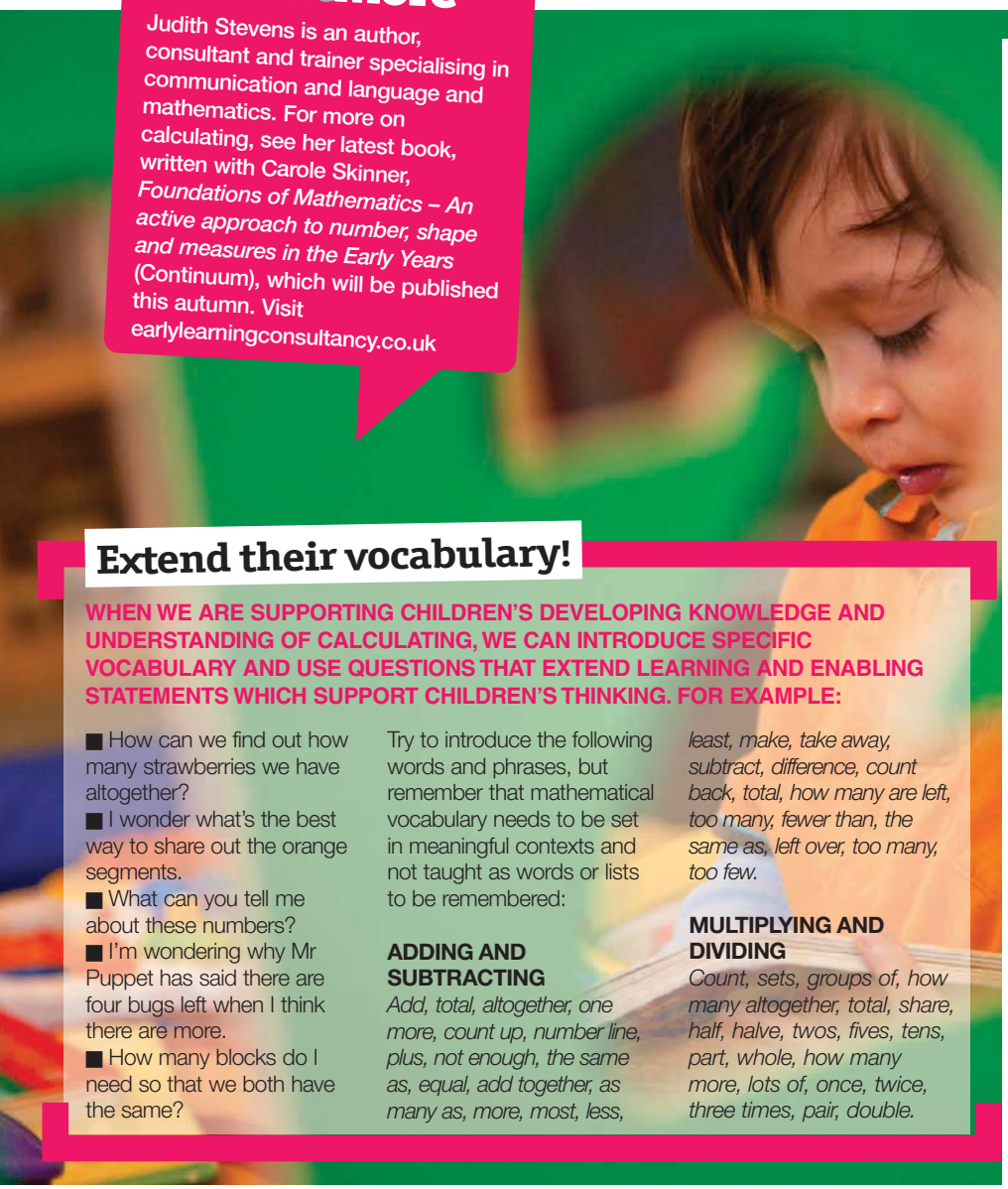
experiences could include:

- opportunities to retell the rhyme with magnetic props and salt dough buns;
- baking currant buns;
- making playdough buns;
- using cake cases, bun trays, candle holders and candles in the sand;
- exploring recipe cards and books;
- investigating balances and weighing scales;
- matching numbered buns to bun trays.

Remember to focus on calculating, not just counting, when using number rhymes. Give children opportunities to 'act out' the rhymes and physically move – as toys in a bed, elephants on a spider's web, aliens in a flying saucer or frogs on a log. If there are 10 children in the bed and one falls out, how many are left? What if two fall out? If there are three elephants playing on a spider's web and one more joins, how many are there altogether?

findoutmore

Judith Stevens is an author, consultant and trainer specialising in communication and language and mathematics. For more on calculating, see her latest book, written with Carole Skinner, *Foundations of Mathematics – An active approach to number, shape and measures in the Early Years* (Continuum), which will be published this autumn. Visit earlylearningconsultancy.co.uk



Extend their vocabulary!

WHEN WE ARE SUPPORTING CHILDREN'S DEVELOPING KNOWLEDGE AND UNDERSTANDING OF CALCULATING, WE CAN INTRODUCE SPECIFIC VOCABULARY AND USE QUESTIONS THAT EXTEND LEARNING AND ENABLING STATEMENTS WHICH SUPPORT CHILDREN'S THINKING. FOR EXAMPLE:

- How can we find out how many strawberries we have altogether?
- I wonder what's the best way to share out the orange segments.
- What can you tell me about these numbers?
- I'm wondering why Mr Puppet has said there are four bugs left when I think there are more.
- How many blocks do I need so that we both have the same?

Try to introduce the following words and phrases, but remember that mathematical vocabulary needs to be set in meaningful contexts and not taught as words or lists to be remembered:

ADDING AND SUBTRACTING

Add, total, altogether, one more, count up, number line, plus, not enough, the same as, equal, add together, as many as, more, most, less, least, make, take away, subtract, difference, count back, total, how many are left, too many, fewer than, the same as, left over, too many, too few.

MULTIPLYING AND DIVIDING

Count, sets, groups of, how many altogether, total, share, half, halve, twos, fives, tens, part, whole, how many more, lots of, once, twice, three times, pair, double.

Collections

Many young children love to collect things, and this sometimes means precious small objects are secreted in handbags in the home corner or even pockets! We need to give children lots of opportunities to explore interesting collections of everyday objects such as treasure, socks, ties, clocks, watches, bags, purses, coins and balls, as well as natural objects such as shells, cones, pebbles and leaves. By providing fascinating bags and boxes, we can encourage children to make their own sets of items that interest them.

When exploring sets, we know that rather than focusing on matching sets of objects by 1:1 correspondence, we should focus more on recognising equivalence, 'greater than' and 'less than'. Support the children as they compare the number of items in two sets and add them together, or take them away.

Number tracks and number lines

Young children need access to both number tracks and lines when they are playing and working with calculations, as they support the development of mental imagery. On a number track each number or picture occupies a space. Number tracks always start at one, and many popular board games such as Snakes and Ladders incorporate them. Children with little experience of playing board games that use dice and a number track will often count the space they are on as a move, rather than the jumps they make. You can help overcome this misconception by using big floor number tracks and playing games where children actually jump themselves along the track.

When the children become familiar with playing track games, support them in making their own games and devising their own rules. Sometimes this is easier to begin outdoors – with large chalks. The rules created by children are often far more complicated than those made by adults, and tend to be modified as the game develops. These games offer many opportunities to explore calculating in an active, physical way.

TRY
The missing toys

Gather five soft toys, a shallow basket and a pillow case. Arrange the toys inside the basket, count them together and identify that there are five altogether. Cover two of the toys with the pillow case and ask the children to work out how many are missing. Demonstrate how to count on using fingers: hold up three fingers to represent the three toys that the children can see and slowly unfold the other two fingers to represent the missing toys. Continue the activity by having different numbers of toys missing and inviting the children to hide them.

Subtracting

We need to understand how children learn about subtracting before we can support them effectively. There are three different aspects to subtraction that young learners encounter. Firstly, there is the physical removal of objects from a group – the 'take away' aspect, which we often practise through number rhymes. Secondly, there is subtraction as 'counting back', and finally, 'find the difference', which very young children often struggle with.

Teaching children to solve addition problems by counting on can be detrimental to their understanding if it results in a learned procedure rather than being based on a secure understanding of the counting words in order. It is important that practitioners do not create an over-reliance on 'counting on', but we do need to find fun ways to explore 'finding the difference' with children.

Finally...

In an environment that supports early calculation effectively, you should be able to observe the following when children are in engaged in their play and daily routines:

- They use and understand the language of calculation such as altogether, more and fewer.
- They use counting to find out the total number of objects in two groups and make sensible estimates of the total.
- They compare amounts in two sets and say which is more or fewer.
- They record using objects or marks they can interpret and explain.