

REVISED ELGs

Introduction:

BEAM is a small independent organisation, owned by the publishers Nelson Thornes. We are suppliers of Early Years and Primary mathematics education products, resources, consultancy and continuing professional development throughout the UK and internationally. We have a national team of highly respected early years and primary mathematics specialists who are experienced in working with leadership teams, practitioners and teachers to raise achievement in mathematics across Early Years settings and Primary schools. BEAM is a holder of the NCETM Standard for Continuing Professional Development.

We welcome the opportunity to respond to this consultation on the Government's proposed changes to some parts of the learning and development requirements in the revised EYFS framework: the early learning goals in mathematics.

Numbers:

Children count reliably with numbers from 1 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.

BEAM consultants wholly endorse high expectations for all children, with appropriate challenge and support provided by practitioners.

We understand that the proposed changes to the revised ELGs for mathematics aim to ensure that the goals offer the right amount of stretch, are age appropriate and provide an adequate baseline for the start of Year 1.

However, although there may be some benefits to raised expectations in the proposals for *Numbers*, by raising the individual targets expected of every young child without reference to current research may disadvantage many. Raised expectations of the activities young children can be expected to engage in might be included in exemplar material, and is not the same as setting unachievable targets for all.

We have a number of concern surrounding the phrase, '*Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number*'.

- Children in YR should experience numbers beyond 10 and some use these in real situations and in their play. However the inclusion of this goal for all children is not appropriate because this may lead to a push towards more unsuitable paper based activities. Evidence suggests, for example, that children need to understand cardinality (Bermejo et al, 2004) and need opportunities to explore this in real life situations, starting with moving real objects as they count.
- The wording of this sentence is unclear and could lead to misinterpretation. It is unclear whether the expectation is that children should recognise numbers, count aloud in order or match 1-1 for 20 objects. Misinterpretation by practitioners may lead to the expectation that this includes children writing numerals in order, which would be inappropriate. Evidence shows that, rather than focussing on matching sets of objects by 1:1 correspondence, more could be made of recognising equivalence, greater than and less than when comparing sets (Sophian, 2007)
- If the intention is to ensure all children have opportunities to experience numbers to 20, wording could include: '*count to 10 and beyond*' and to include problem-solving '*sometimes using numbers to 20*'. The 'teens' are particularly difficult for some children (more difficult than 21,22, 23...31.32,.33 etc). These children need time to consolidate their number knowledge to 10 before moving to 20.
- This is an opportunity to change the wording of the ELG from '*one more or one less*' to '*one more or one fewer*', which is the correct term, although examples, as part of development matters, should ensure that this doesn't become a meaningless task.
- Raising numbers to 20 may appear appealing in terms of adding challenge, but this may lead to a tick list approach. The one more or 'less' than numbers to 20 may open the door to flash cards and a culture of 'fill in the missing number' sheets which is not appropriate for young learners. Including terms such as 'in practical, meaningful situations' would help alleviate this.

We would also like to comment on the phrase '*Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer*'

- The phrase 'using quantities' does not make sense and this needs further clarification. There is a risk that '*add and subtract two single digit numbers*' might be interpreted to mean using written numerals, which in turn may lead to written addition and subtraction 'sums', which are inappropriate at this stage. Furthermore, addition and subtraction to 20, which may be

achievable for *some* children, is not for *most*, and therefore not an appropriate ELG. E.g. We believe that it is an unreasonable expectation that the majority of YR children could add 8 and 8 to find the answer 16. This is a higher expectation than currently at NC level 1. By including this goal, many under 5 year-olds may be labeled as mathematical failures before they start statutory school.

- Halving and sharing is very appropriate to explore in Y1 (KS1), and many children will be exploring equal sharing as part of problem solving experiences in YR. However, the sentence ‘they solve problems, including doubling and halving and sharing’ is open to misinterpretation in many ways, and limits problem solving opportunities offered. Problem solving in the EYFS involves children identifying their own problems, often springing from fascinations and individual interests – some children *may* be interested in halving and doubling, but this implies all children should be engaged in such problem solving. This limitation ignores the starting point of individual children’s passions – which could just as easily be huge numbers, even numbers or counting on in threes. It also implies that all children should be doubling, halving and sharing and may lead to inappropriate, non problem solving based activities. We would suggest an alternative wording along the lines of ‘*they solve problems, in real and practical contexts, using their growing number knowledge*’
- It is important that practitioners do not create an over-reliance on ‘counting on’. Teaching children to solve addition problems by counting on (5 + 3 is solved by counting 5, 6, 7, 8) was found to be detrimental to children’s understanding if it resulted in a learned procedure rather than being based on a secure understanding of the counting words in order (Weiland 2007). The inclusion of ‘counting on’ and ‘counting back’ is not backed by research evidence with this age of learner. Young Loveridge’s (2011) well-known New Zealand research demonstrates that that five year olds cannot add by counting on, in fact only 25% of six year olds could do so.
- Some inclusion of descriptors of attitudes to mathematical exploration such as ‘*approach mathematical experiences positively*’ would be welcome and reference to children’s ability to explain what they are doing e.g. ‘*can talk about the mathematics they are doing*’ or ‘*can discuss their mathematical ideas*’. Goals like these are more likely to have a positive impact on future mathematical learning in Y1 and beyond.
- There is a risk that an inappropriate ‘raising of the bar’ for ELGs in mathematics for *all* children may lead to a larger proportion of children not achieving the goals by the end of the EYFS because practitioners may choose inappropriate teaching strategies to meet this requirement. As a result we would suggest that practitioners should receive professional

development to help them understand what it means to stretch and challenge those pupils who need it in the FS to ensure that effective practice in mathematics is maintained in all settings

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'.

BEAM are happy that this goal is age appropriate – but there will need to be clear guidance offering examples e.g. playing with and handling equipment which will help them to measure and examples of the everyday language that would be expected.

It would be preferable to replace 'distance' with 'length' and be clear that weight, capacity, length etc are all elements of size.

References:

Bermejo, V., Morales, S., & DeOsuna, J. G., (2004). Supporting children's development of cardinality understanding, *Learning and Instruction*, 14(4), 381-398.

Sophian, C. (2007). *The origins of mathematical knowledge in childhood*, Hillsdale NJ: Erlbaum.

Weiland, L. (2007). Experiences to help children learn to count on, *Teaching Children Mathematics* 14(3), 188-192.

Young Loveridge, J. (2011) 'Assessing the mathematical thinking of young children in New Zealand: the initial school years' *Early Child Development and Care* 181:2, 267-276