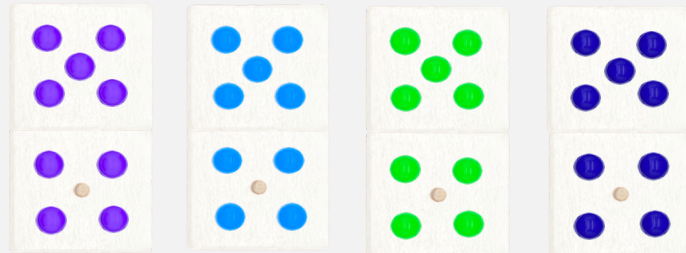
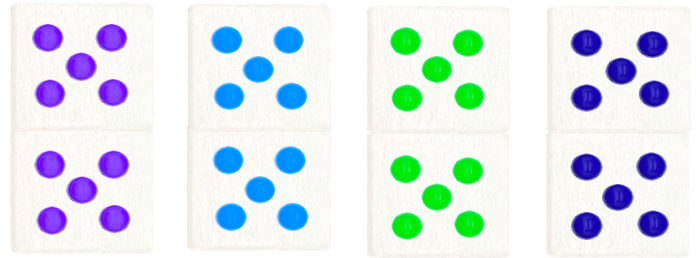


Exploring the structure of numbers with the Spot On With Numbers Pegs and Boards

Inspired by page 11 of the EEF's Guidance Report on 'Improving Mathematics in Key Stage 2 and 3':
<https://educationendowmentfoundation.org.uk/tools/guidance-reports/maths-ks-2-3/>

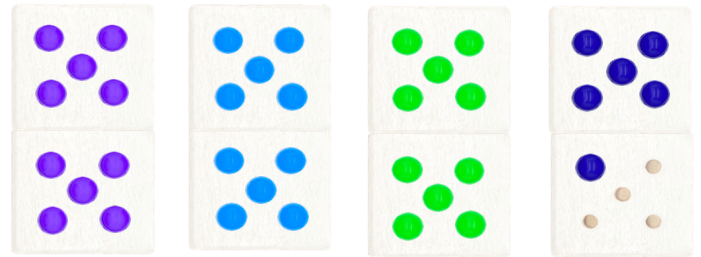
If the Pegs and Boards are stored filled in groups of 10, it is fairly easy to make large numbers like 40. The advantage of this manipulative is that 40 is easily subitised and any manipulation of the pegs, also creates an easily subitisable result.



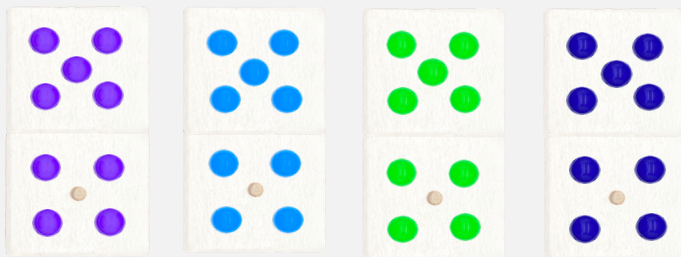
So, if one is taken from each group of 10, we have an instant appreciation of 4 groups of 9.

If 4 is taken from the last group of 10, we can clearly subitise 36:

This is important for children with poor working memory as they do not have to hold the information in their head, but can see 3 groups of ten and a six:



Every part of the arrangement is broken down into subitisable chunks. This decomposition of number can lead to the discovery of even more mathematical structures:



$$5 \times 4 = 20$$

$$\underline{4 \times 4 = 16}$$

$$\underline{9 \times 4 = 36}$$

This gives children encounters with different distributive aspects of numbers:

$$4 \times (5 + 4) = 4 \times 5 + 4 \times 4$$

Exploration of numbers in this way can help visualise the composition of numbers when dealing with fractions and ratios. Consider these two questions in the light of the above visual:

- 1) In a group of 36 children, $\frac{4}{9}$ of the children are boys. How many girls are there?
- 2) In a box of chocolates, the ratio of dark to milk chocolates is 5:4. If there are 16 milk chocolates, how many dark chocolates are there?

Explorations into the structure of number can provide a deep, flexible understanding of number, which provides a bridge to understanding a wide range of topics and the links between them.