# Spot On With Numbers Highlights Links

The five dice formation links to the fingers. Fingers are the first place a child begins to understand numbers. Jo Boaler from Stanford University refers to research from neuroscience which has shown that when we perform a calculation problem, an area in the brain which 'sees' fingers lights up and the more complex the calculation, the greater the extent that this somatosensory area is engaged. (https://www.theatlantic.com/amp/article/478053/).
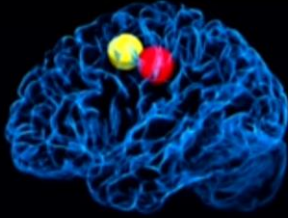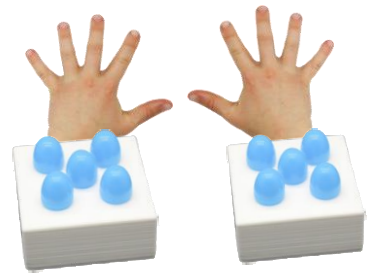
Encouraging use of fingers and showing links to the fingers should therefore be a key component of early maths teaching.

Boaler goes so far as to say that 'stopping finger use is akin to halting mathematical development' (https://www.youcubed.org/resources/jos-tedx-talk/).

We also know from the teaching for mastery model and the work of the NCETM that children need to see the links in their learning. The five dice formation links to the pattern on the dice for all numbers up to five. Beyond five, children can see links to both five and ten.

- A striking example from brain science on fingers
- Our brains "see" fingers when we calculate

yellow is using,
red is seeing

Bertelleti, I & Booth, J (2015) – see youcubed.org
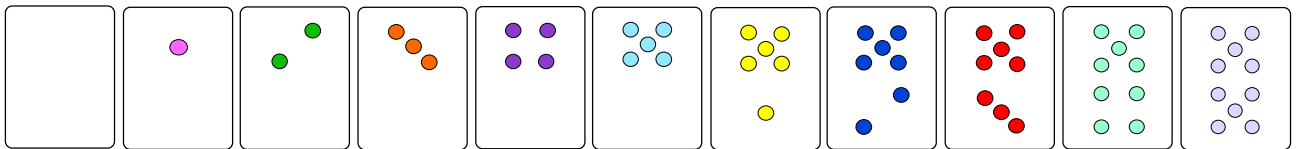
The above representations on the transparent cards are useful for showing the number bonds to five, how they link to the number bonds to 10 and provide a visual representation for the number bonds to 20 and 100 (the Spot On With Numbers Number Bonds Guide explains this further).

The links to five and ten also help with retention of multiplication facts (see 'displays numbers in a highly visual format').

The card patterns above show only one representation for each number, but the pegs and boards can be used to show multiple representations. We also know that teaching for mastery encourages many representations of a number as the variation deepens number sense. Using the pegs and boards to explore multiple representations gives children variation in the structure of a number and encourages subitising.
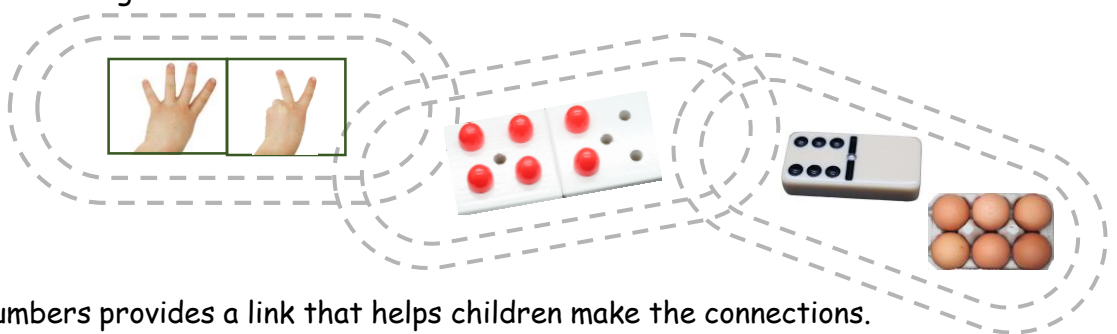
Spot On With Numbers provides a link that helps children make the connections.

spot on®
with numbers