

What we did:

We focussed on structure and progression, moving from the 'Group Model' to the 'Array Model', making clear connections and with **experiential manipulation** from one model to the other, and back again: moving from enactive to iconic to symbolic, over time.

Participants from 8 schools undertook 3x50 minute planned 'Research Gap Tasks' with a group of year 2 children

What we noticed:

MAIN RESEARCH QUESTION: Is the array effective as a core model for the development of multiplicative reasoning in Year 2?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	0	0	25%	75%

SUB QUESTION: Can Number Blocks support this process?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	0	25%	12.5%	62.5%

SUB QUESTION: Are Year 2 children able to access conceptual understanding of multiplicative reasoning through the array?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	0	12.5%	12.5%	75%

SUB QUESTION: Is the array model, when taught progressively and experientially, less abstract for KS1 children than suggested anecdotally?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	0	0	25%	75%

Why this is significant: KEY FINDING

Our evidence suggests that the array is a strong model in year 2, if introduced in a structured, progressive, experiential way - with clear connections to the group model.

'Since starting the intervention the children are more confident at using the terms row, column and array and identifying rows and columns. They are also more able to derive calculations from arrays and talk about arrays needing to have an equal number of objects in each row and each column.'

'It enables the small steps of learning to be broken down in a carefully planned sequence moving from groups into arrays and use of real concrete objects into more abstract pictorial resources'

'It has been really beneficial to be part of this project and see the importance and effectiveness of teaching arrays progressively. In the past, I have certainly taught lessons ... omitting the essential steps we have explored during the project. When I now reflect and think about this, it is such an abstract concept and the importance of each step is essential and has shown that it enables children to secure a more concrete understanding of arrays and what they represent'

Evidence from RIWG qualitative data

Next steps:

1. Proposal for new RIWG to test these findings
2. Co-author 'Guidelines for Good Practice' based on findings
3. Co-present findings at Conferences 2023/24
4. Write article for Research Journal 2024/25

'I strongly agree with the argument that the array model, when taught progressively and experientially, is less abstract for KS1 children than suggested anecdotally. This is supported by the finding in the Third GAP task by the children's ability to explain, solve and create real objects in groups, use real object in arrays, draw pictures of object in arrays and finally identify abstract arrays in the real world.' RIWG Participant