Schemas and Maths

East Midlands EARLY YEARS STRONGER PRACTICE HUB

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Schemas!
Really… thats a load of rubbish… never mind schemas and maths

This was my opinion many years ago … twenty-seven to be precise … when I was told my daughter, Georgia, had a containing, transporting and enveloping schema. As it was, a few months earlier I'd given birth to my son Harry – who I often popped in his pram (containing), covered up (enveloping) and took for a walk (transporting) – to my mind she was just copying me!

How wrong I was…but I took some convincing, which makes me able to relate to the schema sceptics I come across today.

It turns out that Georgia was containing lots of different materials in lots of different types of containers (containing), she was burying things in the sand, and painting over her paintings (enveloping) and moving materials and objects around the setting all the time (transporting).All these things are very mathematical and were supporting Georgia to come to an understanding of several partial concepts (which is what schemas are, according to Athey).

She was learning about conservation of number and amount – equivalency. If nothing was added or taken away, the number of items she transported around remained the same whether she carried them around the setting, lined them up or scattered them across the floor. They just look different!

When Harry was a toddler, he lined everything up and connected things together whenever he could … I was much more prepared by this stage to support him in his play – knowing that even if I wasn't entirely sure what he was learning he got involved for periods of time and it seemed important to him. Initially I struggled with the ideas of 'content' and 'form'. When asked what he was interested in I was saying 'He just loves playing with Thomas the tank engine'. This was the 'content' of his play – the thing he seemed to like, and I was offering him more train related toys, which widened his experience a bit…but not enough!

Once I realised that he actually liked connecting the track together and connecting and disconnecting the carriages it was like a lightbulb going on … now I could widen what I offered him by looking for different things he could connect and disconnect. This was the 'form' of his play – what he was doing, his schema. Lining up and connecting is very mathematical too … each time he added an item to his line it got longer and each time he took one away it got shorter … addition and subtraction in its early stages. This type of play is also the basis for early measurement.

The Department for Education Help for Early Years Providers website offers resources, activity ideas and advice for teaching maths to early years children.

Department for Education

The Education Endowment Foundation (EEF) Evidence Store provides evidence informed approaches and practices to support maths in the early years.

Education Endowment Foundation

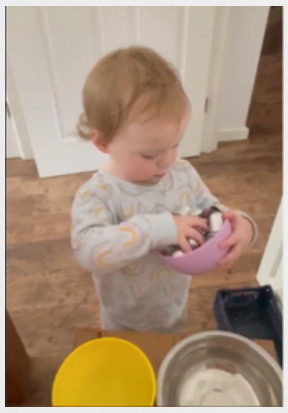
Schemas and Maths

Understanding that schemas are the basis of conceptual understanding

Scroll on thirty-three years and I have a grandson, Ezra who is four and a half and a granddaughter, Indie who is 18 months old. I now understand that schemas are the basis of conceptual understanding and so should be supported, by offering lots of different first-hand experiences for children to carry out what seem like random things to do such as:

- Line things up / throw things (trajectory)
- Contain materials and items in different size containers (containing)
- Carry things from place to place (transporting)
- Connect and separate objects from each other (connecting)
- Covering things up (enveloping)
- Spinning themselves and objects (rotation)
- Putting items through holes such as letterboxes (going through a boundary)

I guess if I'd had as many first hand experiences of containing then I'd know whether to pick the tall thin wine glass or the short fat wine glass because I would have developed a deep understanding of conservation of amount, (the amount remains the same if nothing is added or taken away), equivalence – the wine is the same amount even though it looks different, and capacity – the glasses can hold the same amount of wine even though it appears as though this is not the case! I may have enjoyed maths more if I knew it would support my love of wine!



Here Indie, my granddaughter, who is 18 months is containing lots of coffee pods in three bowls … the amount remains the same whether they are in one bowl, two bowls or spread out amongst three bowls. So much of maths is concerned with transformation and equivalencies.

To find out more about children's schemas and maths and how to support this in your setting, please sign up to our webinar. Introduction to Schemas and Maths Thursday 6th July 2023 6-7pm.

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