Mathematical moments: 3 & 4 year olds
Spatial reasoning
Construction: Builder and Copier

The nursery children loved playing in pairs at being the Builder and the Copier, with one making a construction and the other copying it. Sharon, their teacher, gave them each six oblong wooden blocks, two square blocks, a smaller block, three figures and a mat to build on (video available here).

Sharon encouraged the Copier to follow the Builder one piece at a time. She was impressed by the children’s attention to detail, and the way they looked closely and corrected themselves. She described what they were doing, using positional language like on top of, on the side and in the middle but found that the children needed a lot of nudging to describe what they were doing as they built. However this improved as they gained experience, and the children became keen to get involved with each other’s turn, giving advice freely (including when they did not approve of the construction they were copying!). They both checked carefully at the end, to make sure the copy was exact.

The children also enjoyed making large scale constructions with big blocks outdoors, each in a space chalked on the ground, with four square blocks, one long block, one long plank, one short plank and three toy animals. Watch the video.

The language involved was often not mathematically precise: for instance, Put that there, was accompanied by gestures and pointing.
More challenging were relative terms like, *at the back*, which depended on the viewer's position. It was interesting whether the children were doing a copy in the same orientation or as a mirror image, and some constructions included both.

Later the children copied photographs of other children's constructions, which presented the challenge of working out which blocks were used and how they fitted together at corners, when they were not completely visible in the photo.

Some children had a go at drawing the constructions: this was even more challenging because it involved distinguishing the different size blocks as well as showing their positions from an overhead viewpoint. Some children preferred to show the figures from a side view, next to the blocks, rather than seen from above superimposed on the block outline.

Sharon had found that the younger nursery children tended to make piles of blocks and were less interested in copying another's actions but the older children were keen to take on a role, chatting to each other as they worked. The children's actions (how they moved the items) and attention (where they were looking and when they paused to think it through) revealed much about their spatial reasoning. While this was not the language-focused activity she expected, it engaged young children in a lot of noticing about shapes, orientation, position and location in a very socially collaborative way.

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