



# Thinking with Things

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Language is one step removed from its referents. This ought to make language a harder medium to think in than using physical things themselves, rather than words, as things to think with. For cultural and historical reasons, thinking has been assumed to be propositional. So artisans, bizarrely, are not assumed to be thinking while they work unless they are entertaining word heavy thoughts. Physical toys and models, gesture, manipulation of clay, paintbrush and blocks are not media that we are allowed to think in. I explore how we might reasonably expand our concept of thinking to include manipulatives – blocks, toy soldiers, physical mechanisms. I argue that to think with something involves projecting a structure onto it that makes it behave like a model (construed in model theoretic terms). The cost of manipulating this physical model is often lower than manipulating a purely internal symbolic model. This holds especially when the external thing is interpreted self-referentially, as a token of its own type. For instance, when I think of how the cap of the pen in my hand can be pulled off, I am using the cap and pen as a token of how caps and pens of this type work. Accordingly, when we play with something we are often using the activity of that thing as a simulation that reveals something general about how things like that work and behave. As we become more practiced in our use of things we improve our procedures for operating with them, thereby lowering the cost of projection and developing deeper physical and mechanical intuitions about their behavior. This may explain part of what children learn through playing with things: they develop physical and mechanical intuitions that they can call on later as explicit understanding of things: for example, that caps sometimes snap on pen-like things. Their thoughts, then often look a lot like “if I do *this*, then *this* happens”.

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