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Title: Imagination in play and imagination in STEM

Eminent scientists, like Albert Einstein and Barbara McClintock, worked with theoretical contradiction, thought experiments, mental models and visualisation—all characteristics of children's play. Supporting children's play is a strength of early childhood teachers. Core to the theoretical foundations of this presentation are the cultural-historical concepts of imagination (Vygotsky, 2004) and play (Vygotsky, 1966). My research shows a link between imagination in STEM and imagination in play. A scientific PlayWorld, an Engineering PlayWorld, digital PlayWorld and a STEM PlayWorld were developed from the results of this research. In this presentation we will explore the relations between imagination in play and imagination in science. The first part of the presentation will look at a cultural-historical conception of imagination, the literature on imagination and science, and models of teaching science in early childhood settings. How children become oriented towards STEM in collective play is one of the central problems facing those interested in the relations between play, learning and development. The second part of the presentation will focus on the results of a study of children's imagining and scientific thinking. New models of play practice are needed to support imagination and the validation of their STEM thinking. The presentation concludes with the concept of *learningful play*.

Vygotsky, L.S. (1966). Play and its role in the mental development of the child. *Voprosy psikhologii*, 12(6), 62–76.

Vygotsky, L.S. (2004). Imagination and creativity in childhood. *Journal of Russian and East European Psychology*, 42(1), 7–97.