

Constructing an Active Brain: How Creative Play Sparks Brain Development

From a series of articles by author and educator Elizabeth Slade

Today I watched Bella, who is three years old, construct a spaceship out of LEGO bricks, or something that loosely resembles a spaceship anyway. She carefully manipulated the interlocking pieces, lining them up and pressing them together. I stopped, surprised, and wondered: when did she move beyond building simple walls that were just one brick on top of another? And for that matter, when did she move beyond her DUPLO collection and finally into her two brothers' world of smaller LEGO bricks?

Looking back, I can picture her at twelve months surrounded by large, colorful square and rectangular QUATRO bricks, her first LEGO set. She didn't throw them, testing gravity, like Isaac at her age. Nor did she bang them together to make music like Jasper at her age. Instead she fingered them. She turned them around in her little hands, looking at them. What was she noticing about them? Their size, shape, color, the bumps on top, holes on the bottom? Without expressive language under her belt there was no way for her to tell us, but the latest brain research suggests that most, if not all, of those thoughts were occurring as she toyed with her bricks. In fact, through the very act of playing with them, her brain was growing.

A fascinating aspect of the brain is that it is the only organ that is incomplete when we are born. In fact, it has just begun to develop when we come into this world; only the most vital functions, such as breathing, sleeping, and circulation, which are controlled by the lower brain, are up and running in the newborn. Most of the baby's brain development is yet to come and is largely impacted by the baby's environment and experience. Dr. Lise Eliot, mother of three, neuroscientist, and author of *What's Going on in There: How the Brain and Mind Develop in the First Five Years of Life*, adds an interesting twist to the comparison of the brain to a computer. Her insight is that there is no one programming this computer. All the wiring is done in the shop, in utero. This is the role of genetics, the nature part, the brain's initial construction. After the baby is born it is like the computer is plugged in and begins programming itself. All the software necessary, all the connections to fax, printer, speakers, this specialized computer is teaching itself. This is the nurture part, the role of environment. "Babies' brains are learning machines. They build themselves or adapt to the environment at hand."

Phyllis Porter, in her article "Early Brain Development: What Parents and Caregivers Need to Know," points out that human beings have a four year period, from conception until three years old, when the brain is developing. The brain then has a "use it or lose it" approach and unused brain pathways are reduced and those connections are lost. This underscores the importance of early experiences as they are literally building the brain. Porter writes,

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"Touch, talking and things an infant sees and smells all build connections... These connections die if not maintained. If there are no experiences, the connections are pruned back and the brain remains small."



Playing with DUPLO bricks provided Bella with a colorful, multi-dimensional and tactile interactive experience that prompted all kinds of exploration. The authors of *The Scientist in the Crib* posit that babies' brains are wired like scientists where they are constantly experimenting with things they come in contact with. Their brain creates a theory and their hands experiment. As their experience grows their brain refines the theory. Maybe in Bella's young brain it went something like this: This thing is smooth. But wait, this part is bumpy. This thing is smooth and bumpy. But what's this? Under here it is hollow. This thing is smooth with bumpy and hollow parts. All this thinking represents the development of neural pathways, and the more time babies spend exploring their world with their senses the more neural pathways they develop. Eliot writes, "It is certainly no coincidence that environment has its greatest effect at an age when the brain is at its most malleable."

All this is to say that as parents we have the job of making sure our young children get enough stimulation, enough connection to people and things, to begin crafting some theories on how the world works. At this early time, when their minds are literally forming themselves, what we put in their path is the raw material for their construction.

I watch Bella now, a confident three-year-old with both the fine motor skills to build her dreams and the language skills to describe her process. "Mommy, I made mine rocket ship to go to the moon." And I am grateful for

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the time she has had sitting in her pile of DUPLO bricks watching her brothers' space expeditions and generating her own theories about what these brightly colored bricks are and what the creative play possibilities might be. These are theories she continues to test out even today.

Resources:

Eliot, Lise. What's Going on in There: How the Brain and Mind Develop in the First Five Years of Life . New York: Bantam, 1999.

Porter, Phyllis. "Early Brain Development: What Parents and Caregivers Need to Know." Educarer. 2006.

Gopnik, Alison, Meltzoff, Andrew, Kuhl, Patricia. The Scientist in the Crib . New York: Perennial, 2001.

Elizabeth Slade is an author educator who has co-written a workbook "How to Raise a Peaceful Child in a Violent World". In addition she has co-authored a parenting advice column "Ask Bess & Bubby" which appeared in the publication Spirit of Change. Elizabeth is the mother of three young children and works as an educational consultant at various schools in New England. Elizabeth has written two novels and is currently working on a non-fiction parenting book.