Brain Development (and how parents can help)

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Let's start with some vocabulary:

- Neurons are brain cells - the raw material that helps us think and to use our bodies
- Synapses are connections between neurons that help process information and act
- Myelin is a fatty substance that insulates nerve fibers and helps messages travel quickly

A newborn's brain is ¼ the size of an adult's – they have as many neurons as an adult, but not many connections. By age 6, their brain is 92% of adult size, with 500 trillion synapses.

Brain Building Block #1 – Real World Experiences and Time to Explore And Master Them

Children build connections through hands-on, in-person experiences where sight, sound, smell, taste, and touch are all active. No matter what marketers tell you, there aren't any special toys, apps, or classes you have to spend money on. Everyday activities – like a walk around the neighborhood, a bubble bath, singing songs, tasting a peach, smelling a flower, and banging on pots and pans – are great ways to build a brain! What inspires learning:

1. Novelty – the first time a child sees, hears, or tastes something new, they'll look attentive, taking it all in. They're wiring connections for the next time they see it.
2. Repetition – the more times a child does something, the stronger the connections, and the easier it becomes to do it again. With enough repeats, connections become permanent and tasks become effortless. (Think about tying a shoe or riding a bike!)

So, definitely expose children to plenty of new experiences, and give them new things to explore. But don't feel like you have to *continuously* provide more new things. When their attention is focused on something, allow them to explore it in depth. Let them do the same thing over and over to learn. In spending time with something, or repeating a task till they've mastered it, a child gains advanced skills and a deeper understanding of the world.

Brain Building Block #2: Sleep and Quiet Times to Process New Information

Don't overdo things… When a young child is interacting with the world, every sight, sound, smell, taste, and touch is being filed away for future reference. This is why kids can be so wild and over-stimulated after a busy day. They need time to rest quietly and integrate all the new information. (And myelination happens during sleep.) So get out and explore, but also plan quiet times when you're not entertaining or teaching them. Important discoveries happen when they entertain themselves and have time for self-guided practice of new skills.

Brain Building Block #3: Good Nutrition

When brains are growing, they need a LOT of energy. Especially important are healthy fats (like in avocado, nuts and seeds, olive oil, eggs, and fish), as myelin and cell walls in the brain are built of fats. They also need plenty of fluids to drink – the brain is 60% water.

Brain Building Block #4: Safety and Happiness

Children learn from interaction with objects in our world and experiences they have, *within* the context of relationships. They learn best when they're happy. When we feel loved, cared for, and safe, our system floods with oxytocin (the "love hormone") and our brains have a high level of "neuroplasticity" – we're open, flexible, and primed for learning. And we want to remember the things we're doing and to repeat them over and over. That reinforces learning.

When we're stressed, our brain goes into survival mode and we're less open to learning. We *can* learn, but what we learn is how much we want to avoid having that experience again!

The brain is built in stages (here's a map to print: https://gooddayswithkids.com/2015/06/23/brain-map/)

At birth, the *brain stem and spinal cord* are mature. They handle breathing, eating, pooping, etc. Newborns have 2 emotions: content (needs met) or unhappy (needs unmet or system overload). Parents support brain growth by meeting needs and helping the child feel safe.

Next to develop, from birth to age 7, is the *sensory cortex (occipital, parietal and temporal lobes)*, which handles vision, balance, touch, hearing and language. We help these develop by offering diverse experiences which involve all 5 senses, lots of free play, time outdoors, and lots of movement. We talk with our children about whatever they are noticing.

From 8 month to 2 years, the *limbic system* develops. It's responsible for long term memories and emotions. As it develops, children begin to self-soothe – to calm themselves down. Our loving touch, soothing words, consistent responses, and a safe environment help it to develop. So does helping to build emotional intelligence by talking about feelings.

From pre-school to early adolescence, the *cortex* develops, which manages concrete thinking, categorizing, associating. School, organized sports, and music help build this. Children are very primed for academic learning from age 5 and up, so don't worry about trying to push them earlier than that. Focus on play-based learning earlier, and trust that their brains will be ready for all that structured learning when the time comes.

The *pre-frontal cortex*, which handles executive functions – thinking, planning, reflecting, reasoning, abstract thinking, and judgment develops throughout life but doesn't mature till age 22 – 25. Giving your child plenty of time for free play and exploration, and room to make choices – and live with their consequences – helps it develop.

Regression: When your child is upset, they may regress and lose some of the skills they've gained. (Like a verbal child may not be able to talk or understand words when upset.)

Respect their capabilities

It's hard to learn something before the brain is ready for it. If there's something you and your child are struggling with, ask yourself if your expectations are developmentally appropriate. Is there some other skill you could focus on learning now, and come back to this one when they're ready? Remember to be patient with little ones as they grow those brains.