

# Brain Development—How you can help.

Important!! Remember to balance stimulation with rest and quiet time to process it all!

## Frontal Lobe—Concrete Thinking (3 to 12 years)

Have your child sort and categorize objects.  
Encourage problem-solving. Let your child be frustrated sometimes as they figure something out.  
Help your child notice patterns. (“When you do X, this always happens.” “After we do Y, we always...”)  
In your child’s elementary school years (age 5—12) teach reading and writing (not essential to start earlier)

## Prefrontal Cortex—Judgment (12—22 yrs)

Give choices (when your child is calm... they can’t make choices when stressed or upset).  
Talk to your child about plans. Let them make plans.  
Help your child break down big tasks into little steps.  
Give your child some freedom to try out their ideas, and learn from their mistakes.

## Limbic System - Emotions (8 mos to 2 yrs)

Show unconditional love.  
Experience joy with your child.  
Respond in consistent ways.  
Talk to your child about emotions. Teach vocabulary to understand how they feel.

## Parietal Lobe—Language (Birth to 6 years)

Talk, sing, and read to your child.  
Listen to your child and respond.  
Read the same stories or sing the same songs over and over so your child learns to memorize.  
Follow your child’s attention and talk about what they are looking at or doing.

## Parietal Lobe—Touch (Birth to 6 years)

Carry your baby, touch your child, hold hands, hug, massage  
Give your child lots of objects to hold and manipulate.  
Let them touch soft things, rough things, slimy things, etc.  
Let your child explore the world hands-on—pulling, pushing, pouring, stroking, picking up, dropping, turning, twisting, opening, and closing.

## Occipital Lobe—Vision (Birth to 2 years)

Provide interesting things to look at.  
Play games where the child follows things with his/her eyes. Roll the ball, throw the ball.  
Look at pictures and small items up close.  
Play “I spy” and “where’s waldo” and games where they search for visual differences.  
Make sure your child has plenty of outdoor time to develop distance vision.

Thought, memory and behaviour

Language and touch

Visual processing

Balance and coordination

Breathing, heart rate and temperature

Hearing, learning and emotions

## Temporal Lobe—Hearing (Birth to 6 years)

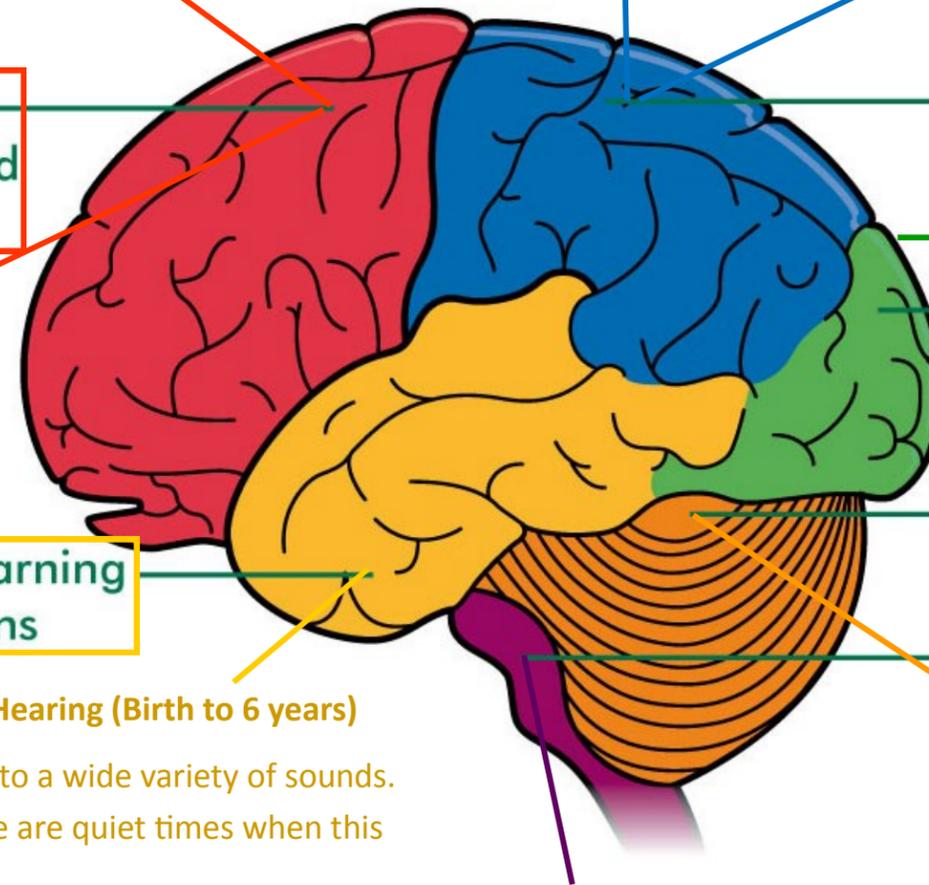
Expose your child to a wide variety of sounds. Also, be sure there are quiet times when this system can rest.  
Listen to music, play music, let your child experiment with instruments / noisemaking.  
Play games where you practice being loud/quiet, echo tunes back and forth, etc.

## Brain Stem—Survival Mechanisms (Developed at Birth)

During pregnancy: reduce stress, minimize alcohol and tobacco. Maximize healthy diet, including omega-3 fats  
After birth: Help your child feel safe, emotionally and physically. If a child is frightened or stressed, the brain goes into survival mode (brain stem function), and the rest of the brain can’t grow and develop. When a child feels safe and happy, the child can learn.

## Cerebellum—Balance & Coordination (Birth to 1 yr)

First 6 months: carry your baby in your arms or a sling to let them experience more variety of movement than in a stroller. Dance with them. Sing songs and move their arms and legs for them.  
Throughout life: Let them move! A lot! In lots of different ways. Take your child to the playground and the swimming pool. Let them climb trees and rocks. Let them run, throw, jump, and kick.



Note: Timeframe given is the “sensitive period” when that part of the brain is growing and developing *the most*. The brain grows and changes throughout our lifetimes, so your child will benefit by all these kinds of stimulation throughout life.

Illustration: Macmillan Cancer Support 2012

# Hands On is Brains On: How Kids Learn through Play

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## **How do children learn (i.e. how does the brain develop)?**

Babies are born with as many brain cells (neurons) as an adult has. But they don't yet have all the connections that adults have that help them use those brain cells quickly and effectively. As children are exposed to new experiences (**novelty**), they create new connections (synapses). When they see the same object again or do the same action again (**repetition**), the connection gets stronger as they develop mastery). When children sleep, they reinforce those connections, and develop insulation (a myelin sheath) that helps the brain makes connections faster and faster, and learn more and more. The more senses a child uses when exploring something new, the more connections, and the better they remember the experience.

**What learning opportunities help?** Kids need a balance of activities to help them learn.

**Direct instruction:** When a parent, teacher or book actively "teaches" a child, we are adding information or foundational skills to their database – their *crystallized intelligence*.

**Free Play:** When a child has a chance for hands-on, self-guided improvisation (play), that helps build *fluid intelligence* – the skill that allows them to adapt stored information to new situations.

**Guided Play:** When an adult plays *with* a child, and asks questions like "what do you think will happen if..." or lets a child make the plan then provides just enough assistance to help the child accomplish their own plan, that takes learning to a new level.

**Rest:** Oftentimes, parents and teachers forget an essential component of learning: down time. Kids need a chance to process and incorporate all the information from all their new experiences. A more extroverted child might process while talking quietly with you. A more introverted child might need solitude – a chance to be alone for some period of every day to absorb everything. They all need lots of quiet time and sleep to allow their brain connections to build.

## **What is play-based learning?**

The adult (teacher or parent) sets the stage with engaging activities. The adult then steps back and lets the kids explore as they wish (free play) or hangs out nearby to observe, ask questions, make suggestions, or play along. (guided play).

Key characteristics of play:

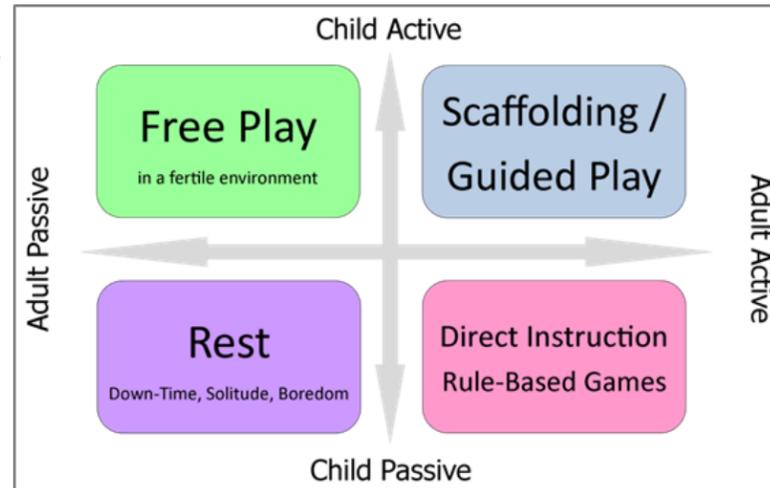
**Child-Led.** Freely chosen. The child is in control. He makes the plan. He decides which activities to do, which toys to play with, what to do with them, and for how long. This self-regulation allows him to "fill his brain" without overloading his brain.

**Process, Not Product.** Play is done for its own sake, not to accomplish a task. It involves lots of exploring of possibilities, experiments, trial and error, and repetition.

**Creative.** The child can adapt items, create something new or experience things in a new way.

**Spontaneous.** It's flexible and open-ended, and it changes and evolves as play time goes on.

**Fun.** The player looks happy and engaged. (We learn best when we're happy!)



## Teacher's Role / Parent's Role in Guided Play

The adult plans an environment and activities which promotes learning. Children learn best when they feel safe, so familiar routines, consistent rules, and respectful caregivers are essential components. The adults offer meaningful experiences that are stimulating, invite exploration and engage kids. The teacher often has outcomes in mind: knowledge, skills, and understandings they want children to acquire. But they haven't determined an exact path the child must take to get that knowledge.

Some roles an adult may play are:

**Set designer:** Set the stage. Create an "invitation to play" that combines familiar objects and activities (for repetition and mastery) with novel objects to explore and discover.

**Stage manager:** Help get them the tools they need to accomplish their play plan. Help clear away the "clutter" that gets in the way of their play. Assist as needed to enable *their* ideas.

**Observer:** Observe quietly. Be there so if they look up with an "a-ha" moment, or an "I did it", you're there to reflect that success back to them. Practice observing for at least 3 minutes before talking. Make suggestions or ask questions to extend thinking, or encourage reflection. Main rule: ask more, answer less.

**Mediator:** Help resolve conflicts by offering new materials or suggesting alternatives, and modelling flexible thinking needed for children to interact with their peers.

**Interpreter:** Help children understand what is meant by another's words and actions.

**Participant in play:** You follow *their* lead, respect their individual style of play. Don't try to make the game your own. Simply be one of the kids who is playing!

**Project Based Learning (Reggio Emilia style.)** When your child demonstrates interest in a topic, you collect resources related to it: books, videos, tools, resources for dramatic play. The child chooses a project and pursues it. You offer support and suggestions as needed.

**Scaffolding:** When a child has mastered something and is ready to move to the next level, an adult can help them get there simply by giving a hint, asking a leading question, modelling a skill, or adapting the materials or activities then letting the child continue to play.

## Benefits of Free Play – Kids who learn by playing gain:

**Physical competence.** Free play allows a child to practice emerging skills till they are mastered.

**Self-direction.** The child gets to make decisions, make plans, and see them through.

**Creativity.** Experiments show that children who are taught "the right way" to use a toy will use it in limited ways. Kids who are allowed to freely explore develop many more creative uses.

**Problem-solving.** When a child creates her own plan for play, she doesn't foresee challenges that will come up that an adult might see. This offers lots of chances for problem-solving.

**Language skills.** Play requires asking and answering questions, giving commands and acting on them, and explaining your goals to the person you are playing with.

**Conflict resolution skills.** There's lots of negotiation that goes on in cooperative play.

**Emotional intelligence.** Dramatic play helps children understand emotions, learn how to express emotions, and distinguish between real emotions and "pretend" emotions.

**Symbolic play.** If a child can use a stick to simulate an ice cream cone, it helps her understand that numbers represent how many objects they have, letters represent sounds, and musical notes show where to place her fingers.

**Better memory.** Kids are motivated to remember things they need to know for a play scenario.

**Reduced stress.** Play is fun. Children play when they feel safe. We are all more capable of learning new things when we are having fun and feeling safe.

**Resources:** [Brain Rules for Babies](http://BrainRulesforBabies.com), John Medina. [www.naeyc.org/play](http://www.naeyc.org/play) and [www.zerotothree.org/child-development/play/](http://www.zerotothree.org/child-development/play/)  
Videos: What About Play: [www.youtube.com/watch?v=IjoG6tMq9ZU](http://www.youtube.com/watch?v=IjoG6tMq9ZU); Play is Children's Work [www.youtube.com/watch?v=FR5pO\\_85fMk](http://www.youtube.com/watch?v=FR5pO_85fMk). Importance of Play [www.youtube.com/watch?v=h\\_-1O\\_rBLPU](http://www.youtube.com/watch?v=h_-1O_rBLPU)