

The first years

Last Forever

7 WAYS TO BUILD YOUR BABY'S BRAIN POWER

1 Touch

2 Talk

3 Read

4 Smile

5 Sing

6 Count

7 Play

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Program Materials



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Building Baby's Brain: Old and New Thinking

Reprinted with permission from the University of Georgia. Bales, D. (1998). Building Baby's Brain: Old and New Thinking. Athens, GA. University of Georgia, College of Family and Consumer Sciences.

As scientists learn more about how the human brain develops, many of our old ideas about the brain are being challenged.

Here are some common myths about brain development:

1. At birth the brain is fully developed, just like one's heart or stomach.

When a baby is born his heart is a tiny version of an adult heart, fully organized and pumping blood. In contrast to other organs, most of your child's brain development takes place after birth. While most of the brain's cells are formed before birth, the cells actually make most of their connections with other cells during the first 3 years of life. And even after age 3, the brain's structure continues to change as connections are refined based on experience.

2. The brain's development depends entirely on the genes you are born with.

Early experiences are equally as important as genetics in brain development. The baby's day-to-day experiences help decide how her brain cells will connect to each other. And if the baby does not have certain kinds of experiences, some areas of the brain will not make the necessary connections. For example, babies born with severe cataracts may never see clearly – especially if the cataracts are not removed until a child is two years old.

3. A toddler's brain is less active than the brain of a college student.

A 3-year-old's brain is twice as active as an adult's. Why?

The adult brain is more efficient. It has gotten rid of connections that it doesn't need. By about age 3, the brain's cells have made most of their connections to other cells. Over the next several years, connections are refined based on experience. The connections that are used most will become stronger. Those that are used least will eventually wither.

“As scientists learn more ... many of our old ideas about the brain are being challenged.”

4. Talking to a baby is not important because he can't understand what you are saying.

Babies must hear language to learn language. The adult vocabulary is largely determined by the

speech/sounds that are heard in the first 3 years of life. And interacting face-to-face builds the brain connections needed for both language skills and a healthy emotional bond.

5. Children need special help and specific, educational toys to develop their brain power.

What children need most are loving care and new experiences. But these experiences don't need to be expensive. Talk and sing to your baby. Go on a daily walk and point out some of the things you see. Sharing time with your child and exposing him to new things, goes a long way toward helping his brain develop.

Beware of overstimulating your child. Some parents are so concerned with brain development that they buy expensive educational toys, videos, and flash cards. But there's no evidence that these toys, by themselves, will make your child smarter. Too many new experiences all at once won't help his brain development. He needs time to process what he's learned before he's ready for something new.



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Building Baby's Brain: How the Brain Develops

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The early years are critical for later life. For years, scientists have known that what happens – or doesn't happen – during the first few years makes a big difference in a child's later life. Babies who do not get enough love and attention in infancy are less likely to be well-adjusted adults.

Scientists recently have learned even more about how important the early years can be. Thanks to new technologies, we now have a much clearer idea of how the brain functions at birth. And we've found out that the brain goes through some dramatic changes even after birth.

Wiring the Brain

A baby is born with more than 100 billion brain cells. Some of these cells are already connected to other cells at birth. These connections regulate the heartbeat and breathing, control reflexes, and regulate other functions needed to survive.

But much of the brain's wiring does not happen until after birth. In the first months and years of life, brain cells form connections in many parts of the brain. These connections are the complex circuits that shape our thinking, feelings, and behaviors.

During these early years, the brain cells make many more connections than the baby will use. The developing brain is a little like a fertile garden. When we plant a garden, we want the crops that we planted to grow and thrive. But when weeds start to grow, there is less room for the plants we

want to grow. By weeding out the plants we don't want, we allow more room for the crops to grow.

The brain has a similar "weeding" process. By about age 3, the brain cells have made many more connections than the child will ever need. But the brain is also efficient at weeding out the connections. It keeps track of the connections that the baby uses most. In time, the brain gets rid of the connections that it does not use regularly. The least-used connections are weeded out so that the most-used ones have more room to grow.

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The Importance of Experience

From the moment a baby is born, every experience taken in by the five senses helps build the connections that guide

development. No two brains are alike! Each child develops individual pathways to deal with his or her experiences. For example, a hearing child makes many connections related to oral language. The brain of a deaf child does not get the experience needed to make those connections. A child who learns to play baseball will make certain connections that a child who never plays ball will not make.

The kind of care a child receives plays a big role in how the brain chooses to wire itself. Parents who talk and read to their babies are helping them develop important language connections. And parents who respond sensitively to their baby's cries are building the emotional connections that lead to healthier relationships.

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Building Baby's Brain: Opportunities for Learning

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The brains of young children are primed to develop extremely rapidly. If they have interesting and appropriate experiences, they will learn more quickly than at any other period in their lives. We've all seen that some skills are learned more easily at younger ages. School-agers are expert at roller-blading after only a few minutes of practice, but grandfathers usually take a little longer.

Especially in the first three years, but continuing through about age twelve, the brain is like a "super-sponge." With only opportunity and encouragement to move, and perhaps an occasional helping hand, children learn to walk and climb, then run and skip. Young children learn the grammar, vocabulary, accent, and meaning of their native language with only simple exposure, rather than deliberate teaching. So it makes sense to take advantage of these prime times for learning by providing children with the three things they need for optimal brain development:

1. Your baby needs YOU!

Infants need close, positive relationships with adults who make the world feel like a safe, predictable place. Babies experience their parent's love through gentle touches and positive, consistent responses to needs for food and comfort. They learn the world is predictable when parents establish routines for meals and sleep. Since poor experiences, such as insensitive care, are likely to have more profound effects on a baby than on a teenager, it's important that parents choose other

caregivers, like child care teachers, based on whether such adults can sensitively respond to the baby's emotional as well as physical needs.

2. Your baby needs BRAIN-BUILDING EXERCISES.

Young children need real life experiences - touching, tasting, smelling, seeing, talking, and listening - to build their brains. By acting on their world and seeing how it responds, children build a mental system of the way life works. When a baby looks at something interesting, like his mother's face, it helps the visual part of his brain develop. When a preschooler plays house, she may pretend to be her mother, picking up a block and talking into it as if it were a phone. Though it looks like play, she's practicing coordinating her emotional, creative, language, and physical brain systems.

3. Your baby needs CONVERSATION.

Rich experiences with language help develop children's brains. Toddlers whose mothers talk with them as infants have bigger vocabularies. By age 4, previous language experience even affects the complexity of children's thought processes. Children need to hear language from birth - long before they can speak. But the best language experiences are ones where the child participates; so sing to your baby while you rock him, answer when he babbles, and play "peek-a-boo." As she grows, extend your conversation: tell each other stories, ask questions, expand on her words ("Yes, a dog. That black dog is huge."), and read and write together.



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Recent reports of brain development research have led many people to feel that there are specific things that must be done at specific times if a child's brain is to develop properly. But there are no simple, quick fixes. For example, providing music or language lessons, even if done at precise times, won't insure that your child goes to the top of his class. And parents don't need to worry that a child will have permanent deficits because they failed to provide exactly the "right" experience. For example, if you respond to your baby's cries most of the time, letting him cry on a particularly fussy day will do him no harm. The brain is developed by the child's total experience of daily life over time. And though the experiences parents provide are essential for optimal brain development, there is an extremely wide variety of ways to provide these opportunities in the course of normal family life.

Here are some guidelines for supporting prime opportunities for brain development:

◆ **Provide a variety of interesting activities.**

Because infants are so primed to learn from whatever experiences are provided, the important thing isn't providing specific experiences at specific times, but providing a variety of interesting activities over time. With a baby, you might simply try to provide something interesting whenever she's awake and alert: a new picture to look at or some time to wiggle on the floor or a spoon to grasp or taste. As your child grows, try to include interesting playthings that encourage him to use his senses to explore all kinds of learning: physical, social, intellectual, and creative. Limit the time she spends with pre-programmed mechanical toys, video games, and television, because these don't provide the rich kinds of experiences her growing brain needs.

◆ **Give lots of opportunities for practice.**

Telling the same stories and singing the same songs over and over may feel boring to you, but not to children. They learn through repetition and repetition of an experience tends to set neural connections. The pathways in the brain dealing with emotions are built and strengthened when parents respond day after day to a newborn's smiles by smiling back or by picking the child up. Language pathways develop when parents talk with their baby during diaper changes and baths and trips to the grocery store. A child whose parents have read to her for only ten minutes a day from six months on has a brain that has

received over 300 hours of this type of stimulation by kindergarten!

◆ **Respond to your baby's cues.**

Infants can't use words to communicate their moods, preferences, or needs, but they send many signals: sounds they make, the way they move, their facial expressions, and the way they make (or avoid) eye contact. Children become securely attached when parents and other caregivers try to read these signals and respond with sensitivity. Research has shown that parents of children whose development is well above average don't use special techniques or programs to push their child ahead. Instead, they follow the baby's lead and respond in ways that encourage continued learning matched to the child's capabilities and interests. For example, when reading to their toddler, they would be likely to choose stories or pictures the child enjoys, to read only as long as the child seems interested, and to involve the child by asking questions or inviting the child to tell the story.

◆ **Provide some challenges.**

Young children learn most efficiently when they're provided with some opportunities to work slightly above their current ability with the assistance of a sensitive adult. Though this may sound complicated, caring parents do it routinely: providing a low table for a new walker to grab until he's confident enough to take his first steps, helping a preschooler find the first few pieces in a new puzzle, continuing to read stories out loud to a first grader struggling to sound out words.

Being a parent can sometimes seem overwhelming. But keep in mind that, though the opportunities you provide are essential for your child's brain development, you don't have to do it alone. Take advantage of resources and programs in your community that can help you in providing your child with a great start: parenting newsletters, home visiting programs, Family Resource Centers, Head Start programs, child care teachers, pediatricians.

For further information:

Ramey, C.T. & Ramey, S. (1999). Right from Birth. Building Your Child's Foundation for Life. NY: Goddard Press.

Or, contact the Family Living Agent in your county UW-Extension office.

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Building Baby's Brain: What Parents Can Do

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Every parent wants a smart child. But until recently we believed that there wasn't much we could do to help the brain develop. Most people believed that a child's genes determined a basic level of intelligence, and little could be done to change it after birth.

Now we know that the brain does a lot of developing after birth. The basic brain cells are present at birth, but most of the connections between cells develop during the first 10 years or so of life.

As we learn more about how young brains develop, parents wonder what they can do to enhance their child's brain development.

The Two Basic "Rules"

The developing brain needs two basics: safety and positive experiences. Parents who want to build their babies' brain power should remember these two rules of thumb:

1. Create a safe environment. When a baby feels stress, the brain responds by producing a chemical called cortisol. High levels of cortisol can slow brain development.

You can reduce your baby's stress by making his world safe, responsive, and predictable. Remove any physical threats. Respond when he cries. And create predictable daily routines so that he learns what to expect from his world.

2. Provide enriching experiences. The brain learns best when it is challenged with new information and then compares the new with existing information. Exposing your baby to new things helps the brain strengthen old connections and make new ones. Even simple activities like a trip to the library or grocery store can help build your baby's brain.

But don't overstimulate the baby. Too many new things, or experiences that are too challenging, will only frustrate your child and may create stress.

“Many of the things you already do as a parent contribute to your child's brain development.”

Everyday Activities Are Important

The good news is that building brain power isn't difficult. Many of the things you already do as a parent contribute to your child's brain development. Even simple activities like cuddling or reading are important. When you rock your baby, his brain builds the emotional connections that lead to healthier relationships. When you read aloud, the brain pathways for language and reading become stronger. These little things make a world of difference in brain development. Here are some more ideas to build your baby's brain power:

◆ **Get good prenatal care.** Even before birth, the baby's brain is developing. Pregnant women should eat a nutritious

diet, avoid alcohol and other drugs, and have regular prenatal checkups. Folate, a B vitamin, helps prevent birth defects, such as spina bifida, and is especially important in the first few weeks of pregnancy!

◆ **Pay attention to nutrition.** A growing brain needs good nutrition to thrive. Breast milk provides the ideal nutritional balance for a baby. If you don't breast-feed, feed your baby an iron-fortified infant formula. And always hold your baby when you feed her!

◆ **Create a safe environment.** Look at your baby's world from his perspective. Are his surroundings clean? Are there dangers such as sharp objects or choking hazards? Does he always ride in a car safety seat?

◆ **Assess your child's physical growth and development regularly.** Have your child's physical development screened, especially for hearing and vision. Neurologists have demonstrated that the lack of visual and sound cues at particular times can cause permanent deficits. For that reason, anything that interferes with clear vision (i.e. cataracts), or hearing (i.e. frequent ear infections), should be corrected early.

◆ **Talk to your baby.** Make eye contact. Smile at her. Play rhyming games. Read aloud. Sing songs. As she gets older, ask questions and explain things to her. All of this helps build language skills.

◆ **Find high-quality child care.** Look for caregivers who provide a safe environment and enriching new experiences for your child.

◆ **Expose your child to music.** Play rich, complex music. Sing songs. Give your child chances to experiment with a wide variety of musical instruments. Dance with your child.

◆ **Limit television, and don't use it as a babysitter.** Children need interaction with real, live people to enhance their brain development.

◆ **Help your child live a balanced life.** Pay attention to the "whole child," not just intellectual skills like talking and reading. Allow plenty of time for running, climbing and other physical play. Encourage creativity. Give your

child chances to play with other children.

Expose your child to enriching new experiences in all areas of life.

◆ **Take care of yourself.** Parents who are stressed tend to pass some of that stress on to their babies. And stress can slow brain development. So take some time for yourself. Find people who can support you as a parent. Talk to other parents about their experiences. The better you take care of yourself, the better equipped you will be to care for your baby.

◆ **Get the information you need.** Many resources are available to answer your questions about child development. Your pediatrician and Public Health Department can answer many questions. Your child-care provider or local librarian may be able to suggest good books on child development. The Family Living Agent in your county Extension Office can give you more information on parenting, and community resources such as [Parenting the First Year](#) newsletter, home visiting and Birth to 3 programs and Headstart.

◆ **Remember, it's never too late!** The brain never stops developing. Children and adults of all ages can learn from new experiences.

What Can Communities, Parents and Other Caregivers Do To Promote Infant Brain Development?

Now that we know the importance of early development, what can we do to protect and promote the development of those growing brains?

On the left we list the key influences or causal processes, based on what the research tells us so far. On the right, you can list the community programs and actions by parents and other caregivers, which could affect each key influence.

<u>Key Influences</u>	<u>Programs</u> What communities can do to help parents	<u>Actions</u> What parents and other caregivers can do.
1. Prevent Head Injuries		
2. Prevent Chemical Exposures, for example exposure to prenatal alcohol and other drugs, and post-natal exposure to smoke, lead, and other toxins.		
3. Developmental Screening, in particular for early vision and hearing.		
4. Prevent Child Abuse and Neglect.		
5. Promote Secure Attachment relationships of babies with their principal caregivers (sensitively responsive, reliably available interaction).		
6. Promote Early Language stimulation that is interactive, elaborative, responsive to the child (not audio tapes, TV, etc.).		
7. Promote an intellectually enriched environment for young children: opportunities to explore at own pace and manipulate objects in the company of supportive, sensitively interactive caregivers.		