Synaptic Density: Synapses are created with astonishing speed in the first three years of life. For the rest of the first decade, children’s brains have twice as many synapses as adults’ brains.

(Drawing supplied by H.T. Chugani)
Babies are born with 1 billion brain cells, called neurons, but they are not connected. Connections are made through sensory experiences - seeing, smelling, hearing, touching, and tasting. When the brain makes connections they are called synapses, and each brain cell can form up to 15,000 synapses. Just to give you a frame of reference, children ages 3-10 have three times as many synapses as an adult.

As we grow older, we have fewer synapses. The brain sheds synaptic connections that aren’t used, and the ones that remain are better organized. When you look at a brain scan of a 14-year-old, there are fewer synapses than in the brain of a 6-year-old. But this isn’t a bad thing; the synapses that remain are the ones that are used frequently. They become more fluid and run with more efficiency and with fewer interruptions. You might wonder how the brain determines which connections are retained. It’s use and repetition that help the brain determine which connections are kept and which are eliminated.

Early experiences not only affect later development but have a decisive affect on the architecture of the brain. For example, a baby will stop babbling if not spoken to. When the connections in the brain are not strengthened, the brain of a baby will shed these connections and the baby may stop this activity altogether and the development of the brain is further disrupted. Early interactions with babies do not JUST provide context; they directly affect the way the brain is “wired” and therefore how well children learn. Synapses are made through outside stimulus, and a child who does not have these early experiences will not reach his or her full potential. So, while starting as early as possible is important, it’s also important to note that there isn’t a cut off age. You can start and continue these activities at any age. When we’re talking about literacy interactions starting in infancy, if a parent hasn’t started when their child is an infant, they should start anyway. It’s never too late to set the stage for learning with some simple practices that we will talk about and that anyone can do.