I will examine brain and cognitive processes involved in math learning in children. I take a distinctly developmental perspective because neither the cognitive nor the brain processes involved in math learning can be adequately understood outside the framework of how developmental processes unfold. I review basic neurocognitive processes involved in mathematical cognition emphasizing multiple brain systems. First, the role of core dorsal parietal and inferior temporal cortex systems which form basic building blocks from which number form and quantity representations are constructed in the brain; second, procedural and working memory systems anchored in the basal ganglia and fronto-parietal circuits which create short-term representations that allow manipulation of multiple discrete quantities over several seconds; third, episodic and semantic memory systems anchored in the medial and lateral temporal cortex which play an important role in long-term memory formation and generalization beyond individual problem attributes. I will discuss neurodevelopmental models that go beyond parietal cortex regions involved in number processing, and demonstrate that brain systems and circuits in the developing child brain are clearly not the same as those seen in more mature adult brains which are sculpted by years of learning. Critically, I will highlight new and unexpected evidence for a critical role for the hippocampal memory system in math learning in children. The implications of these findings for a more comprehensive view of the neural basis of mathematical cognition and learning in both children and adults will be discussed.