



Educating the Scientific Brain and Mind: Insights from The Science of Learning & Educational Neuroscience

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From the day we are born, science surrounds us. Children, adults, and the aged, are constantly bombarded with science: from watching a ball falling, understanding what is in the bottle of water that you drink, to the causes of extreme weather conditions, we deal with science daily. Is there something special about science and scientific thinking? How do children acquire scientific concepts? Is the human brain and mind wired for science? I will explore these topics through the revolutionary new lens of the discipline called The Science of Learning (a multidisciplinary pursuit of learning across the lifespan) and its deeply related discipline that I helped to found, called Educational Neuroscience (a multidisciplinary pursuit of learning at the core of the developing child and schooling). I will offer unique insights garnered from more than two decades of research that illuminate how we learn science and engage in thinking, spanning contemporary science, science phenomena in the world around us, science education, and human development—indeed, discoveries that also lay bare the power of the disciplines of the Science of Learning and Educational Neuroscience. The findings will span multiple methods ranging from observation (real-world scientists in their own laboratories, children and parents at science museums) to experiments on the ways that “every day” people reason about science, to the use of combined modern neuroimaging and behavioral techniques (fMRI, fNIRS and ERP) with students as they grapple with fundamental scientific concepts taught around the world. Here, we will uncover key components of learning that contemporary science education needs to address as we face a future with an increasingly demanding scientific world.