1116-97-1775 **Susan L. Addington*** (saddingt@csusb.edu). *Essential Mathematical and Cognitive Structures in K-5 Mathematics: Where They Come From and Where They Go.* Preliminary report.

Young children come to school with 5 years of learning about the world, and a set of built-in and learned cognitive structures. In the first six years of school, they must turn these raw materials into formal mathematical understanding. We describe some of the essential mathematical structures underlying elementary mathematics (such as sequences, groups, rings, fields, the real line) and connect them with neurological structures (such as estimating the sizes of quantities and subitizing), as well as with cognitive structures that must be developed for further work in learning and using mathematics (for example, composing and decomposing, reunitizing, and reifying). We briefly touch on research in education and neuroscience that supports these ideas. (Received September 21, 2015)