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Aké, Lilia P.; Godino, Juan D.; Gonzato, Margherita; Wilhelmi, Miguel R.

Proto-algebraic levels of mathematical thinking.

Lindmeier, Anke M. (ed.) et al., Proceedings of the 37th conference of the International Group for the Psychology of Mathematics Education “Mathematics learning across the life span”, PME 37, Kiel, Germany, July 28–August 2, 2013. Vol. 2. Kiel: IPN–Leibniz Institute for Science and Mathematics Education at the University of Kiel (ISBN 978-3-89088-288-8). 1-8 (2013).

Summary: Researches on the nature and development of algebraic reasoning in early grades of primary education have been inconclusive about the boundaries between mathematical practices of algebraic nature and those not algebraic. In this report we define primary levels of algebraization in school mathematics activity and prototypical examples of answers to a task for each level, based on the type of objects and processes proposed by the onto-semiotic approach of mathematical knowledge. This model can be useful to develop the meaning of algebra in elementary school teachers and empower them to promote algebraic thinking in primary education.

Classification: F32 C32 H32

Keywords: elementary algebra; mathematical practice; reasoning level; teacher’s training; onto-semiotic approach