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When does a variable vary? Identifying mathematical content knowledge for teaching variables.

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Summary: In what sense is x in the expression $x + 2$ a variable? What do teachers need to know about variables in order to create optimal learning conditions for students? The aim of this study is to understand the mathematical issues and demands of teaching the concept of variables, to outline a body of specialized content knowledge for teaching (SCK). Data from two lessons in two Swedish grade 6 classrooms, with complimentary focus group interviews, were analysed using the mathematical knowledge for teaching framework. Findings suggest some aspects of SCK to be an awareness of the different roles of the algebraic letter x in the expression $x + 3$, the equation $x + 3 = 8$ and the formula $x + 3 = y$, an appropriate use of the terms unknown and variable, and the importance of mathematical contexts for expressions.

Classification: D69 H29 D20

Keywords: algebraic expressions; specialized content knowledge; mathematical knowledge for teaching; variables