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McCrory, Raven; Floden, Robert; Ferrini-Mundy, Joan; Reckase, Mark D.; Senk, Sharon L.
Knowledge of algebra for teaching: a framework of knowledge and practices.

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Summary: Defining what teachers need to know to teach algebra successfully is important for informing teacher preparation and professional development efforts. Based on prior research, analysis of video, interviews with teachers, and analysis of textbooks, we define categories of knowledge and practices of teaching for understanding and assessing teachers' knowledge for teaching algebra. The three categories of knowledge – “school”, “advanced”, and “teaching” – build on the work of Ball and others for elementary school teaching and take into account the recommendations of the Conference Board of the Mathematical Sciences (2001, 2012) for secondary school teachers' knowledge of post-secondary mathematics. Three categories of teaching practices – “trimming”, “bridging”, and “decompressing” – address mathematical uses of knowledge specific to teaching. We argue that the combination of categories and practices must be covered in assessments of teacher knowledge, if the assessments are to be used in research that investigates the presumed links among teachers' content preparation, their knowledge, their practice, and student learning.

Classification: H19 C49 B50

Keywords: algebra; teacher characteristics; preservice teacher education; professional development; teacher education; models; academic achievement; preservice teachers; assessment; content knowledge; teacher knowledge; subject matter knowledge; teaching practice

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