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Studies attempting to link students' achievement to teachers' content knowledge consistently suggest that mathematical knowledge more closely related to practice—for instance, related to specific curricula or to the work teachers do—is more likely to have a positive effect on teaching and learning. Thus, it is not any type of mathematical knowledge that matters for teaching, but rather that which is useful to—and usable in—the work.

What, then, is this knowledge? Based on a job analysis of elementary school teaching, we identify mathematical knowledge shown to improve teaching and learning. We argue that this knowledge includes specialized mathematical knowledge that is distinctly mathematical in nature, is appropriate for collegiate mathematics courses taught by mathematicians, and is not routinely taught in courses for teachers but should be.

In this session, we report on two areas of mathematical knowledge and skill central to elementary teaching: (i) mathematical tasks of teaching (such as choosing illustrative examples, evaluating other people's thinking, or presenting mathematical explanations publicly); and (ii) mathematical practices prominent in the work teachers do (such as those involving mathematical explanation and the use of mathematical language). (Received February 01, 2008)