A Fraction of What We Know

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My intention in this paper is to explore problems that secondary students face in managing fractions, and to help students turn the solutions to those problems into extended learning that will improve their performance in secondary curricula. Throughout my teaching career, working at the levels between 6th and 12th grade, in various curricula of mathematics, the notation and representations of fractions have consistently been points of difficulty for my students. The work I present here is composed of research that I have done on the primary mathematics and fundamental mechanics of fractions. Based on this research I set basic objectives for student learning about fractions, as that learning is situated within secondary courses. I will then present some strategies for conceptualizing and managing fractions, along with examples for assignments, which other teachers may either use as is, take in small parts and modify, or reject in favor of other activities.

The intended audience is secondary teachers who instruct algebra courses, but I hope for most observations here to be pertinent to any teacher who has students who might struggle with the rational fraction as they encounter it within any particular course. Primary teachers may find aspects of the unit helpful as a reference for the topics of study that their students go on to in secondary courses.

(Developed for High School Algebra I, grade 9, and Algebra II, grade 11; recommended for Algebra I, grade 9; Algebra II, grade 11; Geometry, grade 10; and Middle School, grades 7-8)