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Teaching Mathematics with Objects: The Case of Protractors. Preliminary report.

In the twentieth century, American primary and middle schools almost universally adopted protractors for teaching angle measurement and introducing the concepts of geometry. However, it was not obvious that this drawing instrument, which had been employed in professional practice for several centuries, would become ubiquitous in educational contexts. The story of the protractor's journey into schools in fact illustrates a number of the themes that emerge from the historic use of objects in mathematics teaching: 1. The passionate rhetoric of advocates for objects. 2. Grand schemes for reform movements whose lasting influence is ultimately limited and particular. 3. Correlations between objects and the development of educational standards. 4. Expansions in student populations that stimulate reconsiderations of the reasons for teaching mathematics. The talk is based upon lessons learned from the preparation of *Tools of American Mathematics Teaching, 1800-2000*, as well as a recent effort to re-catalogue the protractors held in the mathematics collections of the Smithsonian Institution. (Received December 05, 2011)