

Protractors in the Classroom: An Historical Perspective

Amy Ackerberg-Hastings
Anne Arundel Community College

Introduction

The view of mathematics presented in the school supplies aisles of discount stores revolves around concrete aids: flash cards, rulers, protractors, graph paper, and the like. These inexpensive objects, although snapped up by the general public, are often completely foreign to the daily lives of contemporary mathematicians and mathematics educators. Meanwhile, parents, students, and teachers might assume their classroom tools have some sort of eternal existence outside of historical context. However, beneath surface appearances, there are links between mathematical teaching aids and professional mathematics. The history of mathematics can reveal such commonalities. For example, at the turn of the twentieth century, E. H. Moore required students to prepare graphs on squared paper, easing computation and revealing the ever-present relationship between abstract principles and concrete applications, when he advocated a “laboratory method” of teaching mathematics. [19] [33, pp. 318–319, 327] Yet, the connection between Moore, whose primary reputation was as a research mathematician, and the ubiquitous graph paper of today’s elementary mathematics classroom is no longer recognized by many teachers and mathematicians. Similarly, the lowly protractor has a history that transcends abstract mathematics, applied sciences, and mathematical pedagogy and that deserves to be more widely known. Aspects of this story may assist those teachers who are trying to communicate mathematical ideas to students who may not have a background in abstract reasoning but who do have protractors wedged in their backpacks. Therefore, the purpose of this chapter is to provide an overview of the history of the protractor, incorporating suggestions for applying this story to classroom activities at a variety of academic levels.

The Protractor: A Biographical Sketch

The origins of the protractor are somewhat murky, which is typical for the history of many drawing and measuring instruments. Sighting instruments such as quadrants and astrolabes were commonly marked by degrees well before the sixteenth century. (See Figures 1 and 2 for examples.) Around 1590, English mathematical practitioners began to suggest that such a “divided circle”—with the pinhole sights removed—could be employed along with a plotting board to replace the rhumb and compass method for reading a ship’s course at high latitudes. Thomas Blundeville (fl. 1560–1602) described a semicircular divided instrument for this purpose; he called it the “Mariners Flic” in an appendix to his 1589 *Briefve Description of Universal Mappes & Cardes*. This short treatise led David W. Waters, a historian of navigational practice, to