Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Using the Physics Inventory of Quantitative Literacy as a probe of student mathematical reasoning in introductory physics[1] SUZANNE WHITE BRAHMIA, ALEXIS OLSHO, University of Washington, TREVOR SMITH, Rowan University, ANDREW BOUDREAUX, Western Washington University — Mathematical reasoning flexibility across physics contexts is a desirable learning outcome of introductory physics, where the "math world" and "physical world" meet. Physics Quantitative Literacy (PQL) is a set of interconnected skills and habits of mind that support quantitative reasoning about the physical world. We present the PIQL, Physics Inventory of Quantitative Literacy, in its validated form. Unlike *concept* inventories, which assess conceptual mastery of specific physics ideas, PIQL is a *reasoning* inventory that can provide snapshots of student ideas that are continuously developing. In this talk we will present the PIQL, patterns revealed in our analysis and trends in mathematical reasoning development that we see across the introductory calculus-based physics sequence from data collected over multiple terms at an R1 institution. Preliminary analysis of PIQL data reveals hierarchical mathematical reasoning patterns.

Suzanne White Brahmia
University of Washington

Date submitted: 11 Jan 2020   Electronic form version 1.4