In this talk, we elaborate a framework to define, and a paper-and-pencil instrument to measure, the mathematical sophistication of prospective elementary teachers. We call an individual mathematically sophisticated if her values and practices reflect those of the mathematical community on nine interwoven categories involving patterns, conjectures, structure, definitions, examples and models, relationships, arguments, language, and notation. We describe the Mathematical Sophistication Instrument we developed and report the results of our study of its reliability, validity, and capacity to measure changes. We hope that the instrument provides educators a tool for assessing programs designed to nurture Mathematical Habits of Mind. (Received September 21, 2012)