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Guershon Harel* (harel@math.ucsd.edu), Department of Mathematics, University of California at San Diego, San Diego, CA 92093. *A Definition of Mathematics and Its Pedagogical Consequences.*

Pedagogically and epistemologically, current perception of mathematics lacks cohesion and consistency. Specifically, while modern conception of mathematics insists on rigorous logical justifications, it ignores epistemological justifications. The latter refers to the learner's understanding of how and why a particular piece of knowledge came into being; it concerns the genesis of knowledge, the perceived reasons for its birth in the eyes of the learner. Further, while epistemologically mathematics consists of two categories of knowledge, "ways of understanding" and "ways of thinking" (terms to be defined during the presentation), modern mathematics is conceptualized largely in terms of the first category. These claimed will be discussed in two contexts: (a) pedagogical: observations from empirical studies with students and teachers on the learning and teaching proof; and (b) historical-epistemological: the Aristotelian notion of causality, the debate on the scientificness of mathematics during the Renaissance, Grassmann's theory of extension (*Ausdehnungslehre*), and views of contemporary philosophers on the role of proof. (Received August 04, 2007)