

Comments on A2. Mathematics as Structural Language of Physical Thought (*Maurício Pietrocola*)

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This thoughtful and thought-provoking article by Mauricio Pietrocola is an interesting contribution to the growing body of reflective literature on the role of language in the teaching and learning of physics. Its particular emphasis is on the role of mathematics as a 'structural language', a term that is explained and exemplified in the body of the article.

The article begins by describing the role of mathematics in the organization of physical theories and related physics problems. It then goes on to consider the barrier that this presents to many students and the case for treating mathematics as an instrument of thought in physics rather than a subservient tool for the solution of problems.

Historical examples of the interplay between mathematics and physics come to the fore in the second section of the article. Aristotelian, Pythagorean and Galilean views are compared, the role of geometry emphasised and the impact of mathematization on areas such as electromagnetism considered.

The main discussion of mathematics as a language is contained in the third section. It opens with reflections on the rupture that exists between regular language and the language of science as well as the rift between interpretative language and formal language. Particularly notable is the author's attention to the loss of interpretive power on the part of language in the face of the symbolic power of number. Further thoughts in this domain provide the basis for a discussion of the pedagogical and didactic issues and these lead to a number of important conclusions including the need for mathematics to be explicitly taught as a focus of structural skills rather than a set of merely manipulative algorithms.