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**The nature of argumentation in school mathematics and physics texts: the case of periodicity.**

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Summary: The present study explores reasoning and argumentation in Greek mathematics and physics texts in specific topics related to the notion of periodicity. In our study, argumentation is taken as the sequence of the modes of reasoning (MsoR) that an author develops in a text when organizing and presenting new knowledge. Inductive content analysis was applied on 71 thematic units taken from 4 mathematics and 4 physics textbooks, and a coding system of categories and subcategories of MsoR was produced. Our analysis discerned 4 main categories of MsoR: empirical, logical-empirical, nomological, and mathematical; we argue that each mode of reasoning (MoR) plays a different role in conceptualizing aspects of periodicity. Analysis of the sequence of MsoR in two thematic units raised pragmatic considerations on the text understanding in relation to the scientific argumentation discourse and highlights ontological differences in the two subjects when ascending from observations to generalizations. Educational implications of the findings are discussed.

*Classification:* U20 E50 M50 I20

*Keywords:* argumentation; modes of reasoning; conceptualizing aspects of periodicity; mathematics textbooks; physics textbooks

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