

# Using numerical methods and tools at teaching physics in grammar school

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**Apstrakt.** Nowadays, there is a tendency to change the approach to teaching physics in grammar school. In order to bring students in grammar school closer to real and everyday physics, we need to introduce authentic problems - examples from real life, in particular for modelling dynamic systems. In most cases, only problems with several simplifications and assumptions are analytically solvable. At introducing authentic problems, where because of complexity deeper mathematics is needed, we realize that the mathematical knowledge of students is insufficient. In the digital era, we can use ICT tools to overcome this obstacle. In this contribution, we present the use of two ICT tools: German freeware Dynasys and the use of Euler method at using software, where the students can manipulate with data in spreadsheet, for example Microsoft Excel. For evaluation of the results from both mentioned software we used as reference software the Berkeley Madonna simulation program, which is using the Runge Kutta 4th order method and is payable. All three tools will be presented for the case of free falling object in the air.

**Key words:** education, physics, grammar school, numerical methods, ICT