



# NAUK – INTERAKTIVNA E-GRADIVA IZ FIZIKE

## NAUK – INTERACTIVE E-LEARNING CONTENT IN PHYSICS

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### **Povzetek**

V okviru projektov NAUK za izbrane teme v osnovni in srednji šoli razvijamo podporo k rednim učnim enotam iz fizike. Na osnovnošolskem nivoju ta podpora vsebuje nabor motivacijskih posnetkov s spremljevalnim gradivom,



ki jih je mogoče uporabljati na začetku šolske ure ob vpeljavi nove tematike, za ugotavljanje predznanja in obstoječih predstav ter za vpeljavo nove terminologije. Sama učna ura mora vsaj v osnovni šoli potekati aktivno ob praktičnih dejavnostih in v zahtevnejših primerih ob demonstracijskih poskusih.

Po drugi strani pa so v zadnjem obdobju številne raziskave na področju poučevanja in učenja fizike v srednji šoli pokazale, da poučevanje, ki temelji zgolj na razlagi in reševanju nalog, ki zahtevajo predvsem iskanje pravilne »formule« in vstavljanje podatkov, ne vodi do sposobnosti kritičnega razmišljanja, sposobnosti uporabe znanja v novih situacijah in razumevanja fizikalnih konceptov. Pri izgradnji e-gradiv za fiziko v srednji šoli smo si zato zadali naslednje smernice: dijaki naj bodo aktivnejši pri delu z gradivi, učitelj naj dobi bogato povratno informacijo o tem, kako uspešno so dijaki reševali naloge, gradivo naj vključuje sveže primere iz realnega sveta, ki je blizu dijakom, in gradivo naj na aktiven način vključuje meritve dejanskih poskusov ali pojavov iz vsakdanjega življenja.

Pomemben del učnih enot e-gradiv, razvitih v projektih NAUK, je oblikovanih tako, da učencem in dijakom, ki so bili odsotni ali morda manj pazljivi, omogočajo osvojiti dejavnosti, izvajane v razredu. Kot nadgradnja vsebujejo učne enote možnosti ponavljanja in utrjevanja, učitelju omogočajo aktivni nadzor nad individualno formiranimi nalogami, prav tako pa tudi preverjanje in ocenjevanje znanja s sestavo individualnih, a med seboj enakovrednih testov.

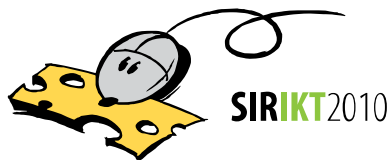
Predstavljeni bodo primeri izbranih novih interaktivnih e-gradiv iz fizike za osnovno in srednjo šolo.

## Abstract

Through NAUK projects we develop a support for regular teaching units for selected topics in physics at elementary and secondary school. At the primary level, this support includes a set of motivational multimedia with accompanying material, which can be used at the beginning of school-lessons while introducing new topics, for the determination of current knowledge and to introduce new terminology. A lesson, at least in primary school, must be active, must include practical activities and, in difficult cases, also demonstration experiments.

On the other hand, in the recent period a number of research studies on teaching and learning physics in high school showed that teaching based solely on the interpretation and resolution tasks, which require particular finding of the correct "formula" and inserting the data into it, does not lead to creation of critical thinking skills, neither to the ability to use knowledge in new situations and understanding physical concepts. In the process of construction of e-learning content for physics in high school, we have therefore set the following guidelines: learners should be more active at using the material (while learning), teachers should get proper feedback on how well the learners solved tasks, the material should include examples from a "real world" which is close to the learners and materials should include interactive measurements of the actual experiments or events from everyday life.

Important part of units of e-learning content (so-called building blocks) developed in NAUK projects are designed in such a way that they allow learners who were absent from a school-lesson or may be less vigilant, to conquer



the activities carried out in the classroom. Building blocks can be used for repetition and consolidation while teachers can actively control individual tasks. Moreover, with the ability to compose individual tests, it can be used for testing and evaluating knowledge.

The presented examples include selected new interactive e-learning material in physics for elementary and high schools.