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Microcomputer-Based Curricular Enhancements for Elementary Physics

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Program Manager Duncan E. McBride

DUE DIVISION OF UNDERGRADUATE EDUCATION

EHR DIRECT FOR EDUCATION AND HUMAN RESOURCES

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Abstract

The project involves adding microcomputer-based enhancements to the curriculum of a new elementary physics course. This inquiry-based undergraduate physics course is targeted at preservice teachers, as well as others who are getting their first exposure to college-level physical science. The theme "energy transformation and conservation" is used to tie together the various topics. Students' preconceptions regarding physical phenomena - as determined by pretesting - will guide the presentation, activities, and discussion. The pretests form the basis for a thorough class discussion of the predictions made by students regarding the outcome of various experiments. Investigations to test their predictions will be carried out by the students, working in small groups, through guided "mini-research projects." Class discussions will be centered around the results of the student investigations, and comparison with the predictions. The equipment acquired via this grant will allow automated means for data acquisition, analysis, and graphing which are intended primarily to supplement, and not to replace, traditional techniques. The product output of this project will be a novel combination of class-tested activities that make use of data analysis in the context of an inquiry-based elementary physics course with an energy theme. We expect

that the project will significantly improve the knowledge of and attitude towards physics of students who arrive predisposed to think of science as distasteful. Dissemination will be through journal articles, presentations at meetings and on-request release of exams, syllabi, etc..

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