

Abstract Submitted  
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**Analysis of shifts in students' reasoning regarding electric field and potential concepts**<sup>1</sup> DAVID E. MELTZER, University of Washington — Students' reasoning regarding the relationships among electric fields, forces, and equipotential line patterns was explored using pre- and post-test responses to selected multiple-choice questions on the Conceptual Survey of Electricity and Magnetism. Students' written explanations of their reasoning, provided both pre- and post-instruction, allowed additional assessment of the changes in their thinking. The data indicate that although students largely abandon an initial tendency to associate stronger fields with wider equipotential line spacing, many of them persist in incorrectly associating electric field magnitude at a point with the electric potential at that point. Analysis of the data also illustrated that the accuracy of specific multiple-choice responses in reflecting student thinking can be strongly time dependent. In our sample, a strong and consistent pattern of correct answers on a specific question (administered before instruction) was demonstrated to provide a highly misleading impression of students' understanding.

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