

Oral Presentation  
New Directions in Problem Solving

**Beyond numbers: Algorithmic problem solving in organic chemistry**  
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In recent decades several research groups have investigated the “algorithmic-conceptual” issue by comparing student performance on paired questions. In many cases the algorithmic question involved a standard calculation (e.g. mole conversion) and the conceptual question incorporated a particulate-level representation. Although general chemistry courses have been the primary context for these studies, some of the “conceptual thinkers” and “algorithmic problem solvers” identified must have taken additional chemistry courses. What do algorithmic and conceptual problem solving look like in other contexts?

This presentation will describe aspects of the “algorithmic-conceptual” issue identified during a recent study of problem solving in organic chemistry. The participants were 22 undergraduate students enrolled in the second semester of a full-year sequence in organic chemistry. The videotaped think-aloud protocols revealed the participants’ problem-solving behaviors as they answered a series of product-prediction questions involving nucleophilic alkyl substitution and elimination reactions. The findings suggest a relationship between functional fixedness and algorithmic problem solving in organic chemistry.