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Techniques for teaching critical thinking in a first year physics laboratory N.G. HOLMES, D.A. BONN, University of British Columbia — One of the highest aims of education research is to explore how students can learn scientific reasoning and critical thinking skills. At UBC, we took on the ambitious goal of engaging students in meaningful reflection of the data they collect in an introductory physics lab. Our aim was to develop habits of mind that were essential to critical thinking. This included a procedural subgoal to teach students a set of data handling skills that spanned from histograms and standard deviation to weighted least-squares fitting. These analytic skills supported the development of advanced experimentation behaviours, including reflecting on data to identify systematic errors and adjusting models based on the quality of fits. This presentation will describe some of the new teaching techniques and course elements that went into achieving these goals and present the dramatic improvements in students' unsupported experimentation behaviours over previous iterations of the course.

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