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Competencies in first-year physics labs and tutorials

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Teaching physics is rapidly shifting from rote memorization to emphasizing conceptual understanding, constructing knowledge through lecture demonstrations and experiments, and applying that knowledge in hands-on situations. The desire for such change has been long expressed by major physics organizations, including the American Institute of Physics, the Australian Institute of Physics, and the Institute of Physics. Consequently, the format and style of assessments also need to evolve to support this emerging approach. The goal is to help students see physics as a practical tool for solving real-world problems.

In this talk, we report on a recent change at the University of Sydney, introduced in first-year student physics laboratories and tutorials. The competence-based assessment involves evaluating students' ability to apply conceptual understanding to practical situations, communicate and negotiate tasks with peers, operate equipment, and critically evaluate measured data. We give an overview of this lab structure and how we implemented this form of assessment in a lab environment.

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