How can paper and pencil tests and performance assessments be used to effectively measure different knowledge types and skills in science?

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Abstract

Science teaching has changed from a text-based to an activity based (hands-on) approximation. This has generated an increase in research and development of different types of assessments. Assessment of science learning requires instruments and techniques that are aligned with the methodology used, and the depth and complexity of what students understand and can do in this discipline. Therefore, assessments need to include a large range of types of tests, formats and instruments. This study compares the results of 5th grade students using three different types of instruments after studying a unit on electric circuits using a hands-on approach. Student learning was assessed with a multiple-choice test, a hands-on performance assessment, and a computer-based performance assessment. Given the changes in the way science is taught, the comparison of these three instruments provides useful information about the viability, feasibility and practicality of using different assessments to measure students’ knowledge and practical skills in science. An additional analysis is done comparing the interchangeability of the two types of performance assessments, with implications in classroom and large-scale implementation of these assessments.