AG7 11:15 a.m. Addressing Learning Difficulties with Circuits: An "Aufbau" Approach

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One of the primary hurdles in understanding electric circuits is the need to comprehend the "global" nature of circuit behavior, in which alterations at one point influence the entire circuit. Students' confusion with the concept of "potential" and with current conservation exacerbates learning difficulties associated with equivalent resistance, and with Kirchhoff's loop rule. I have experimented with active-learning curricular materials that develop the potential concept in unusually great depth,[1] and which strongly emphasize familiarity with behavior of circuit SEGMENTS before building up complete circuits. I will present data reflecting the results of this work; they reveal a significant (but expected) confusion between current and potential, while at the same time providing some evidence of improved learning of circuit concepts.

1. David E. Meltzer and Kandiah Mannivannan, *Workbook for Introductory Physics, Electricity and Magnetism, Part I.*