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Explicit Content and Spoilers: What we know about solving problems

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Take a moment and recognize that you are among a very elite population of people: You are an expert at solving physics problems. In that same moment ask yourself have you ever grappled with a problem that made you rethink how you thought about physics? If so, you have an innate talent for physics. However, the students in introductory physics classes are not experts in physics, or physics problem-solving, or the connection between them. There exists a huge gap between your problem-solving skills and those of your students. Fortunately physics education researchers, cognitive scientists, science educators, and a host of other scientists have been studying student learning and we know how people learn. We will take a few moments to discuss what is known about teaching students to become more competent problem-solvers.