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Using resource graphs to model learning in physics.

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Physics education researchers have many valuable ways of describing student reasoning while learning physics. One can describe the correct physics and look at specific student difficulties, for example, though that doesn't quite address the issue of how the latter develops into the former. A recent model (building on work by A.A. diSessa and D. Hammer) is to use resource graphs, which are networks of connected, small-scale ideas that describe reasoning about a specific physics topic in a specific physics context. We can compare resource graphs before and after instruction to represent conceptual changes that occur during learning. The representation describes several well documented forms of conceptual change and suggests others. I will apply the resource graphs representation to describe reasoning about energy loss in quantum tunneling. I will end the talk with a brief discussion (in the context of Newton's Laws) of how a resource perspective affects our instructional choices.