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Teaching thermal physics in the paradigms project

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Thermal physics is probably the most disliked course in the physics major curriculum, with students feeling that they are being led through a mathematical maze, leading to an unsatisfactory conclusion. Classical thermodynamics involves scary derivatives, while statistical mechanics leads to lengthy summations and is difficult to apply to interacting systems. It is unsurprising that students find themselves failing to see the physics for the math. In this talk, I will discuss my experiences teaching the Energy and Entropy paradigm, and will introduce materials we have developed to aide student understanding of partial derivatives and their relationship to experimental observables.