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Physics Education Research as Guide to Application-based Curriculum Development*

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Students often use several everyday devices without thinking about the underlying physical principles of these devices. Advances in educational research and cognitive psychology have enabled us to gain better insights into how students think and learn (or don't!). Based on this research, we are able to design curriculum that enables students to build their reasoning and construct mental models that explain the physics underlying their everyday experiences.

We will share with you some of the ongoing research and associated curriculum development at Kansas State that is aimed specifically at enabling students to learn the physics of everyday objects. We discuss our research methodology to explore students understanding and an analytical framework to understand the various cognitive tools and processes that students use. Finally, we will describe examples of curricular materials that we have developed based on our research.

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